

CBRFC Forecast Areas

Colorado Basin Water Supply Briefing

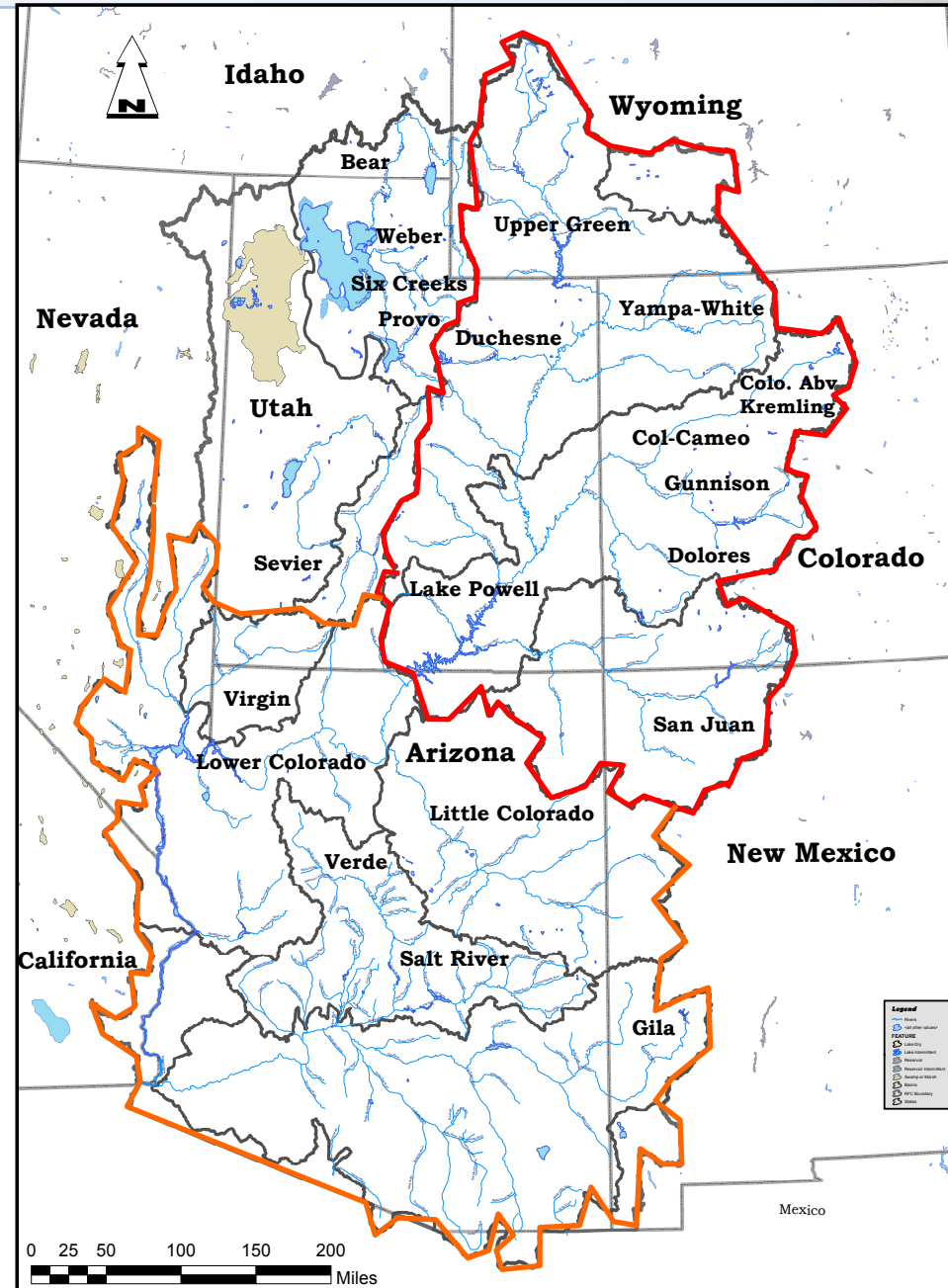
May 7th 2019

Greg Smith - Sr. Hydrologist
Colorado Basin River Forecast Center

Phone: 1-877-929-0660

Passcode: 1706374

Please mute your phone until the
question period
Thank You!



Today's Presentation

April precipitation

A mixed bag with a strong finish in some areas.

Snowpack ended up well above average

Update on current snowpack conditions – Banner year most areas !

April observed streamflow

Low elevation snow had an impact in some areas.

2019 Water Supply Forecasts

Select forecast site review

Flows in similar snowpack years (analog years)

Upcoming Weather

Impacts of upcoming weather on the timing of seasonal peak flows

Contacts & Questions

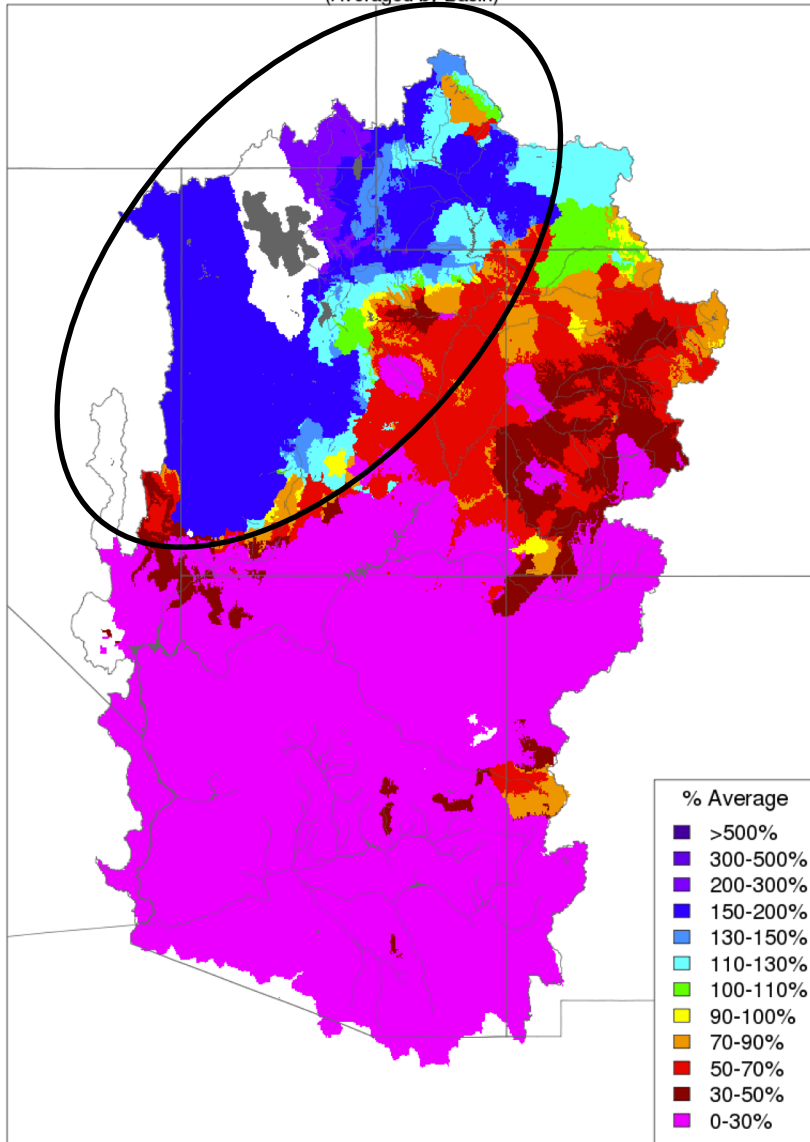
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*** Please mute your phone until the question period ***

April Precipitation

Month to Date Precipitation - April 16 2019

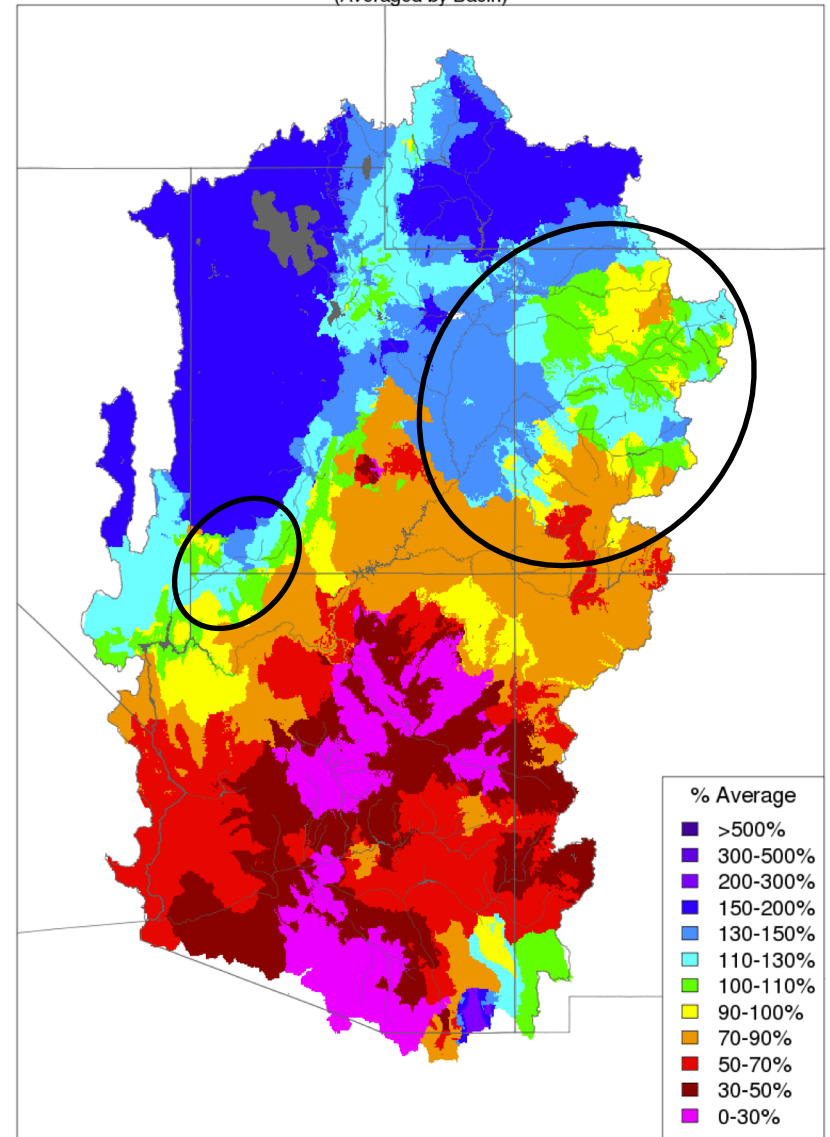
(Averaged by Basin)



Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

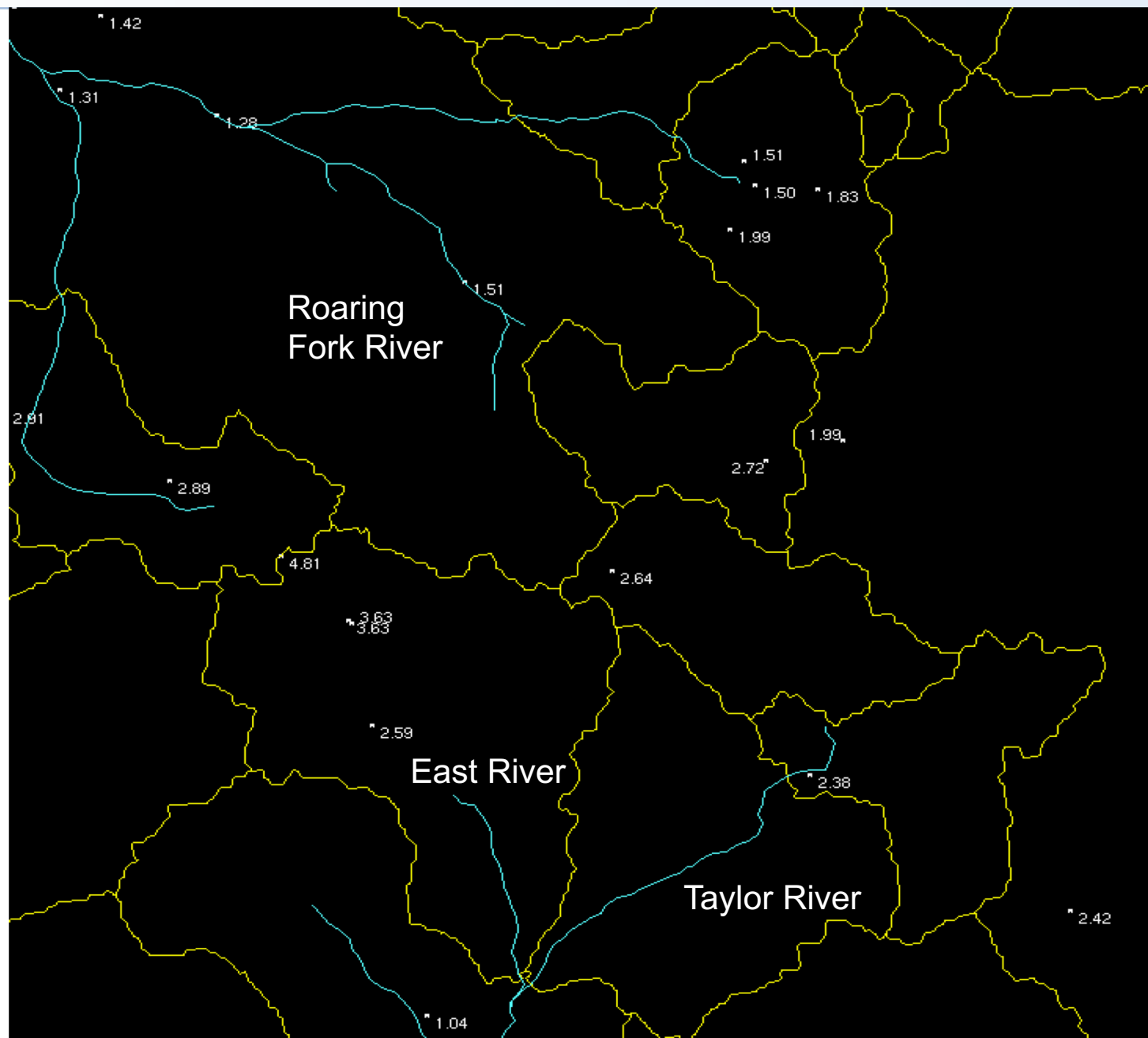
Monthly Precipitation - April 2019

(Averaged by Basin)



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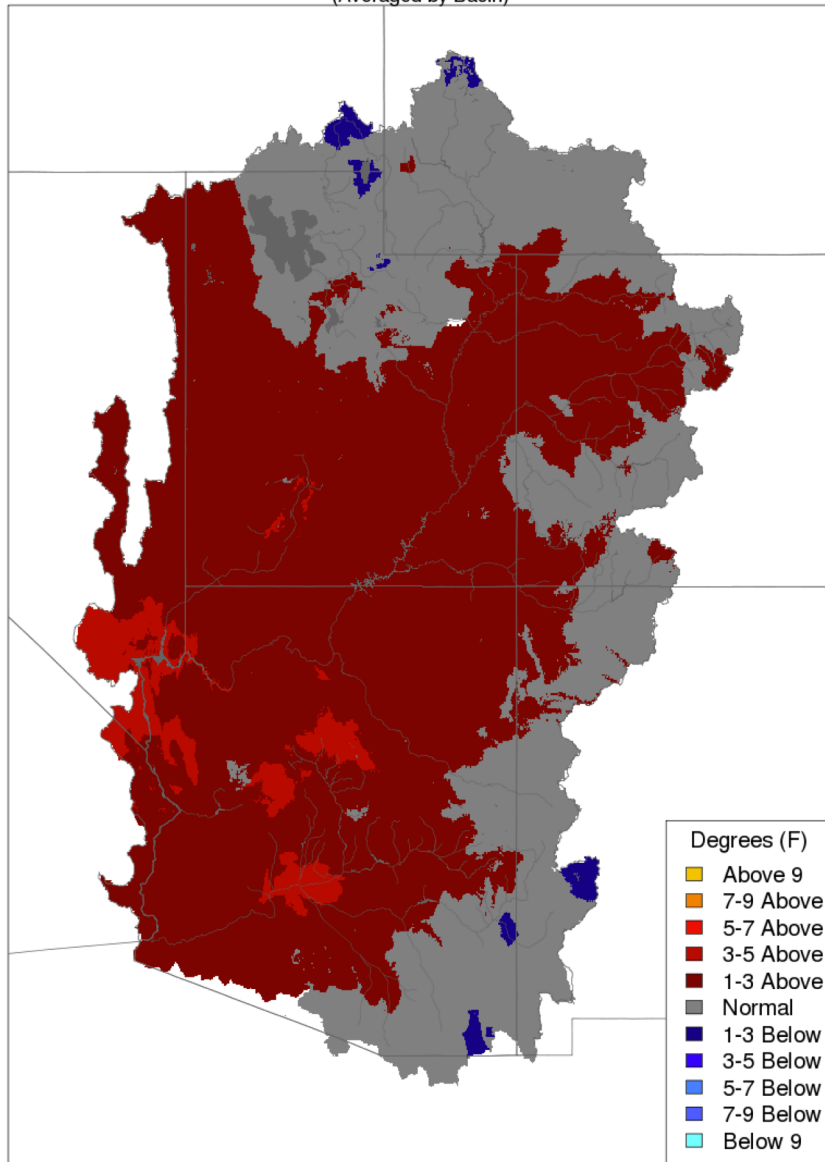
Colorado Headwaters / Gunnison Basin – Precipitation event the end of April
Amounts were near or greater than April precipitation average (Apr 27-May 1)



April Temperature – Mean monthly max and min deviation from normal

Max Temp - Monthly Deviation - April 2019

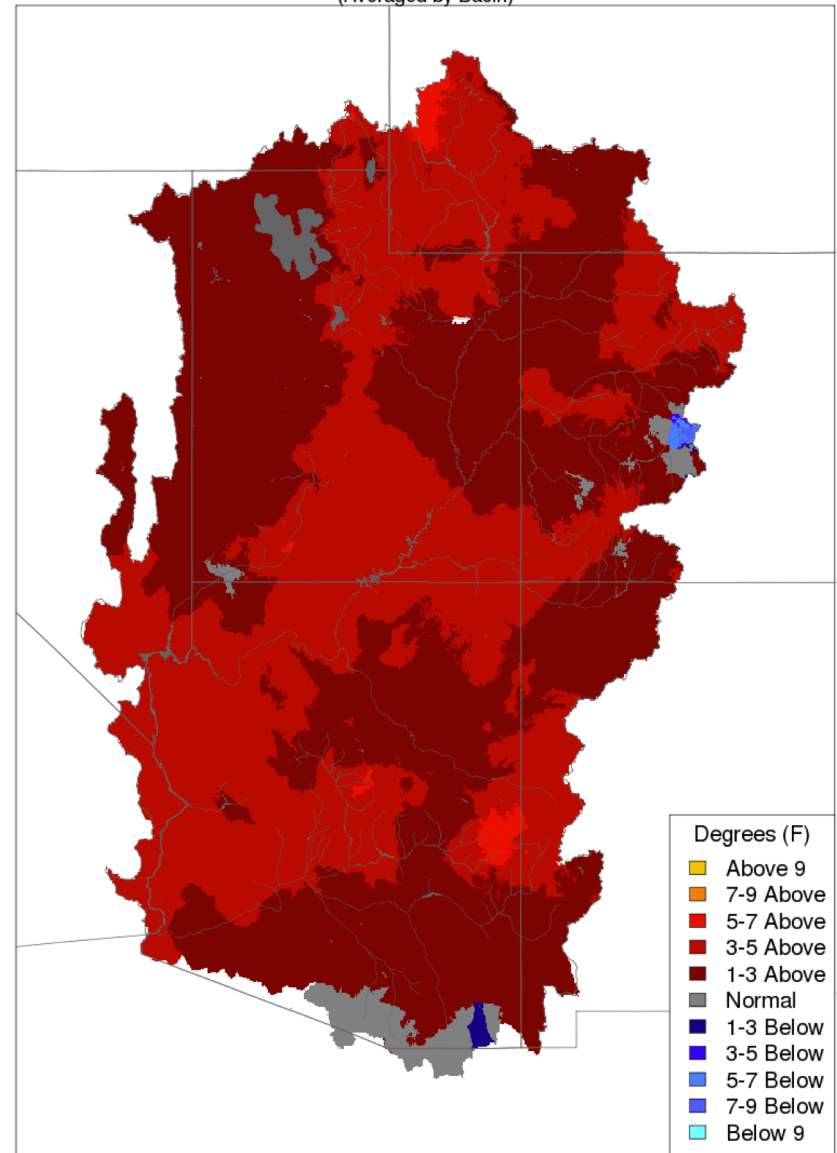
(Averaged by Basin)



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Min Temp - Monthly Deviation - April 2019

(Averaged by Basin)

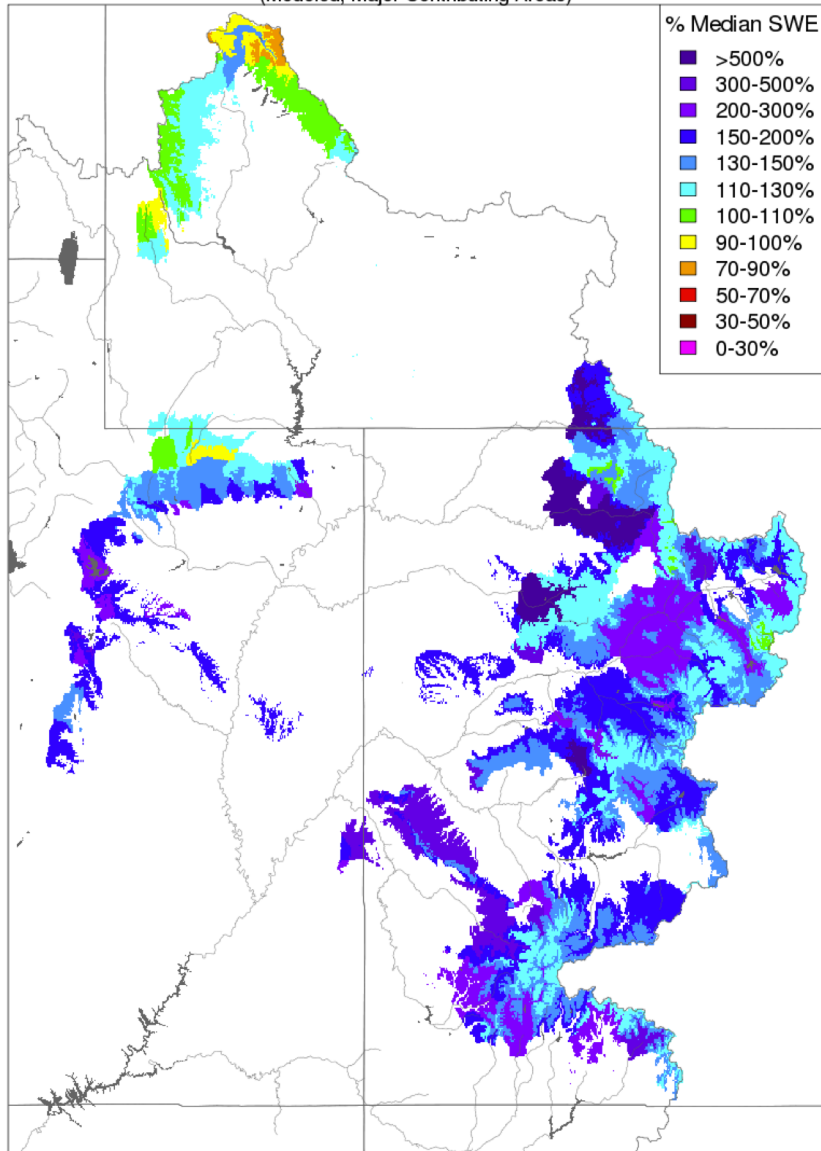


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Snowpack Conditions

Snow Conditions - April 05 2019

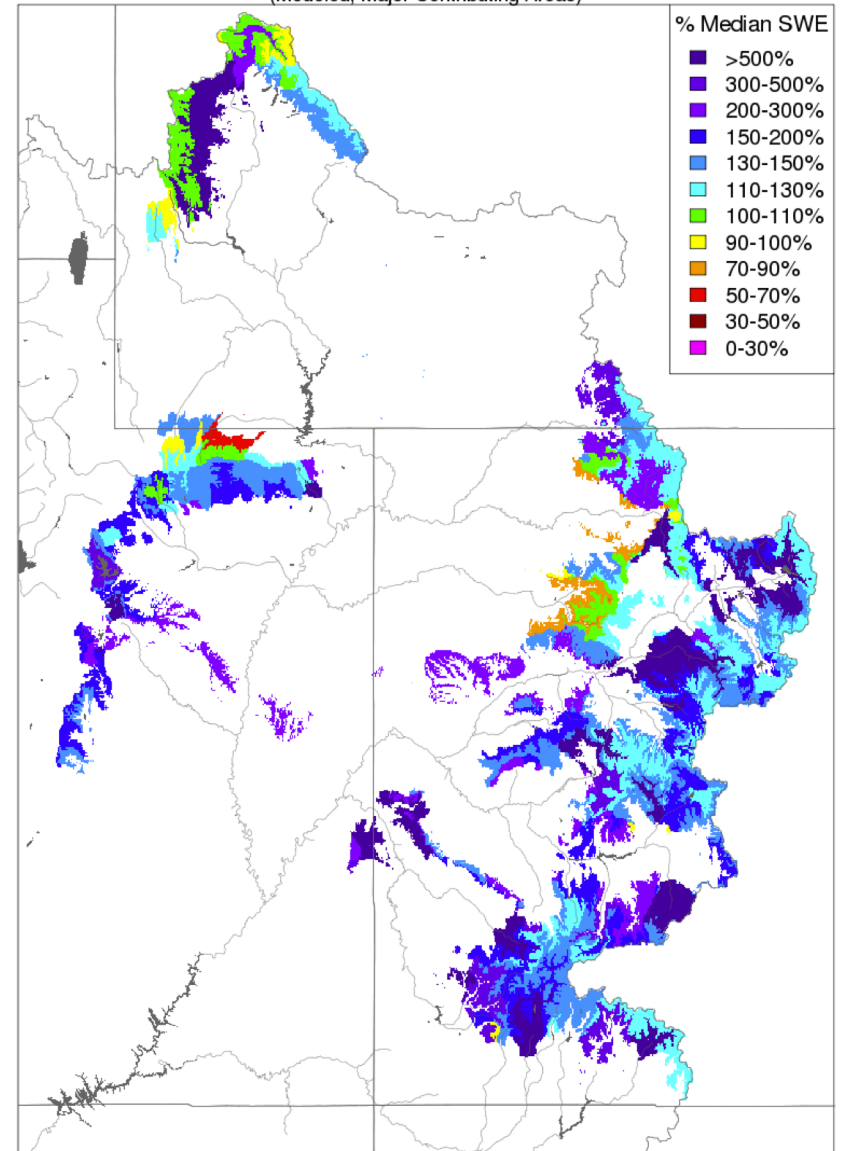
(Modeled, Major Contributing Areas)



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Snow Conditions - May 05 2019

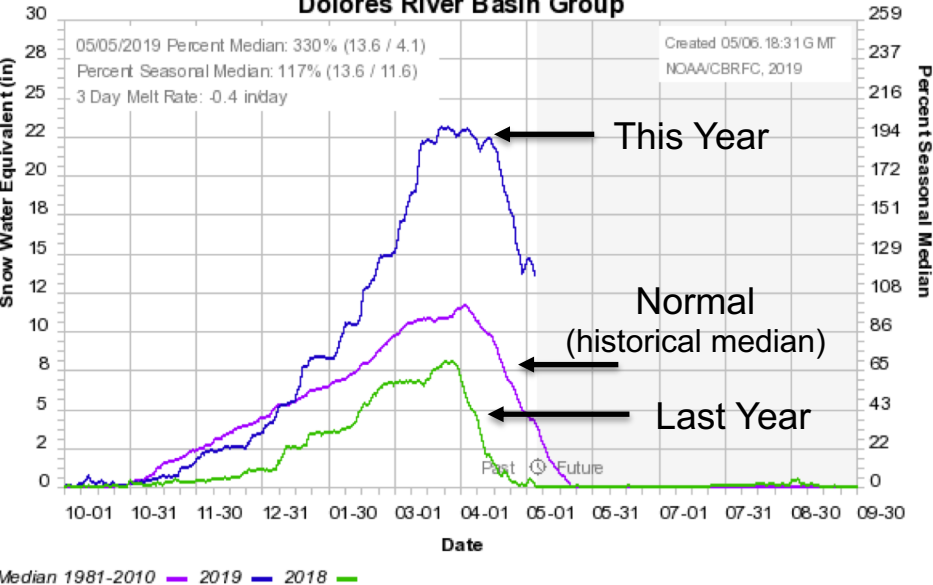
(Modeled, Major Contributing Areas)



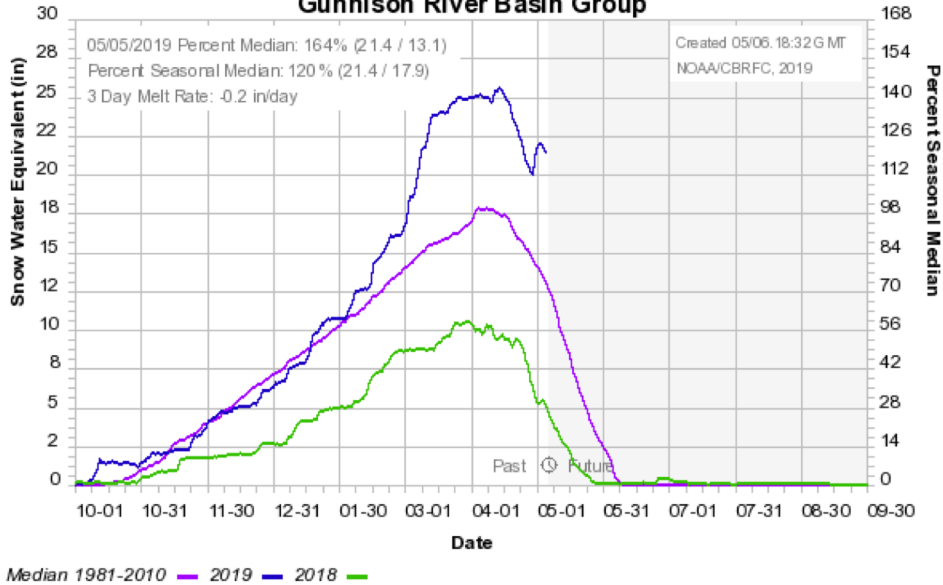
Prepared by NOAA, Colorado Basin River Forecast Center
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River Basin SNOTEL group plots

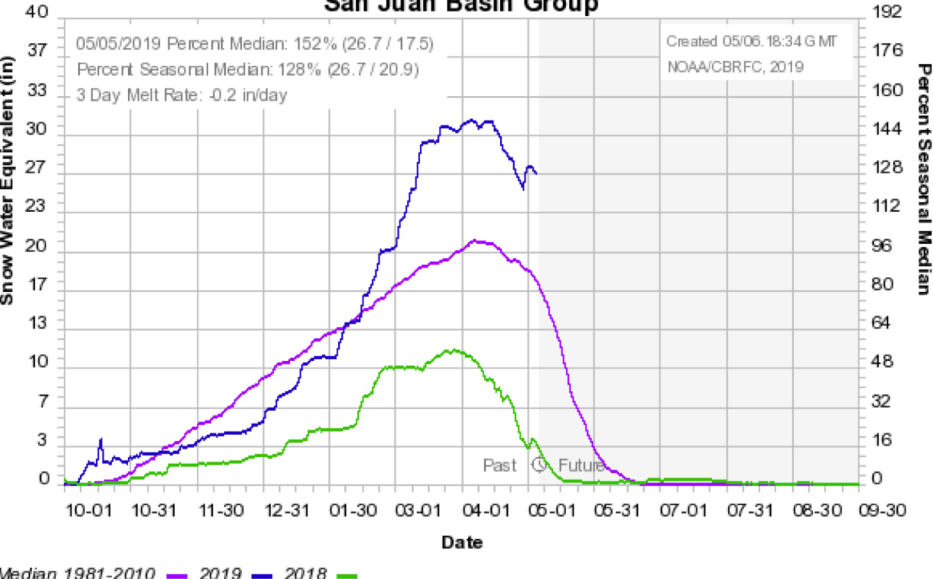
Colorado Basin River Forecast Center
Dolores River Basin Group



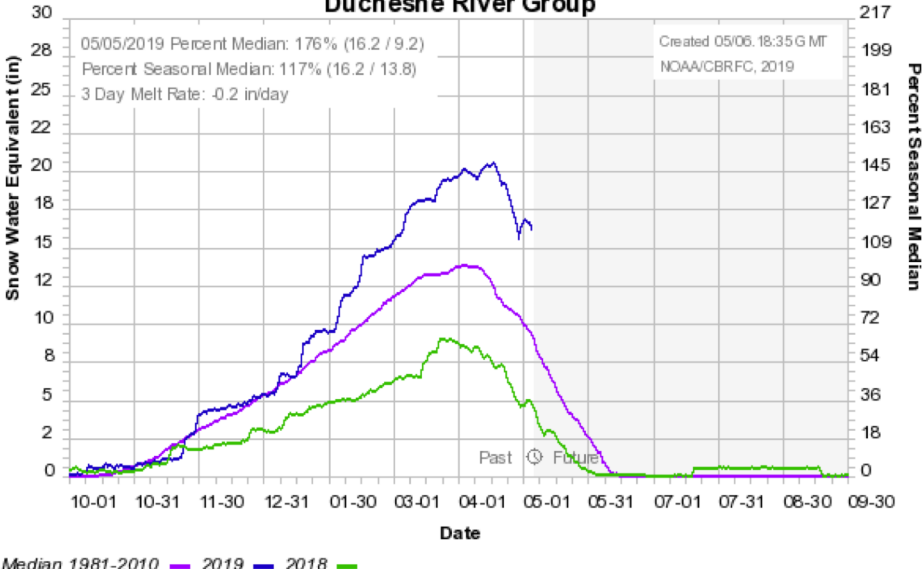
Colorado Basin River Forecast Center
Gunnison River Basin Group



Colorado Basin River Forecast Center
San Juan Basin Group



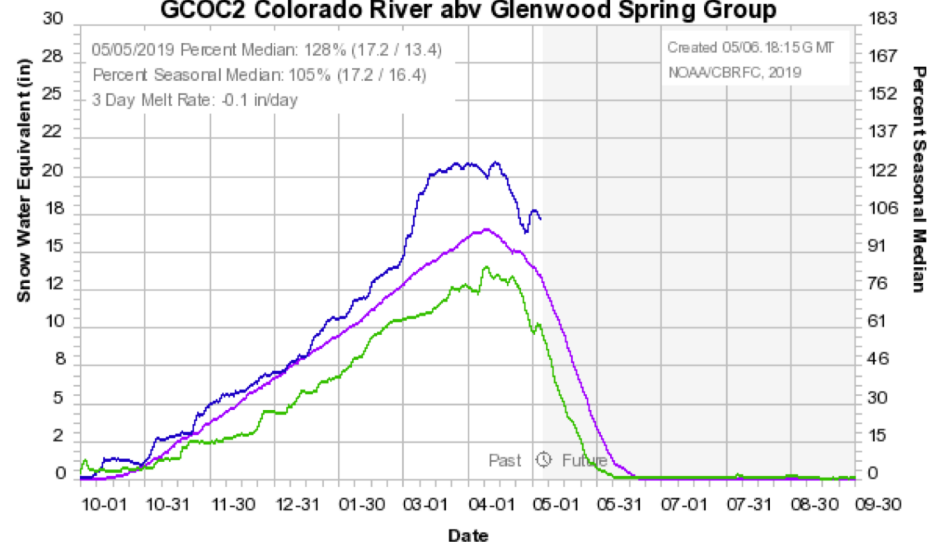
Colorado Basin River Forecast Center
Duchesne River Group



River Basin SNOTEL group plots

Colorado Basin River Forecast Center

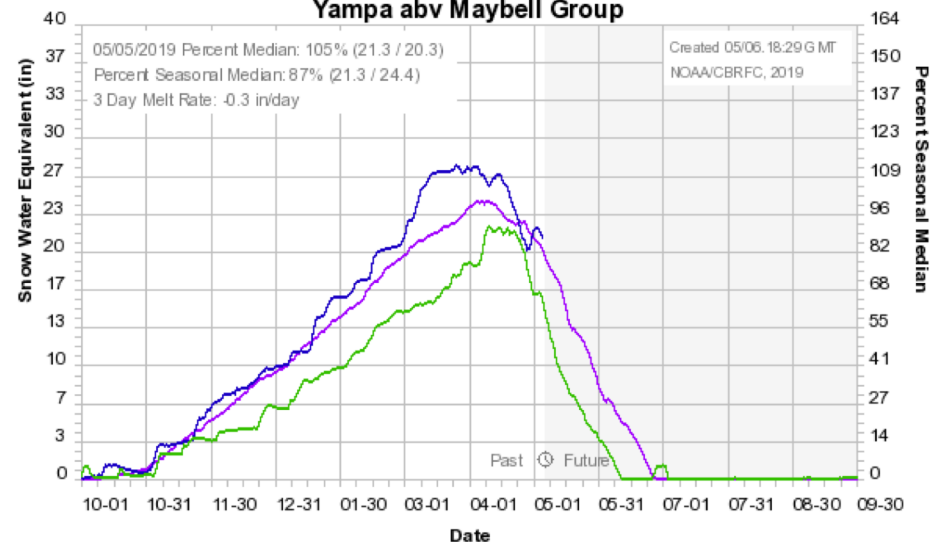
GCOC2 Colorado River abv Glenwood Spring Group



Median 1981-2010 — 2019 — 2018 —

Colorado Basin River Forecast Center

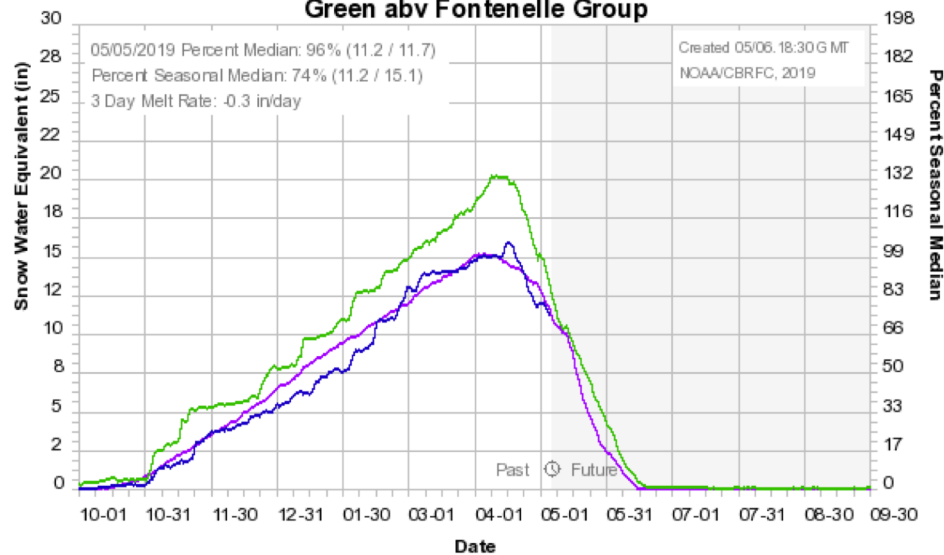
Yampa abv Maybell Group



Median 1981-2010 — 2019 — 2018 —

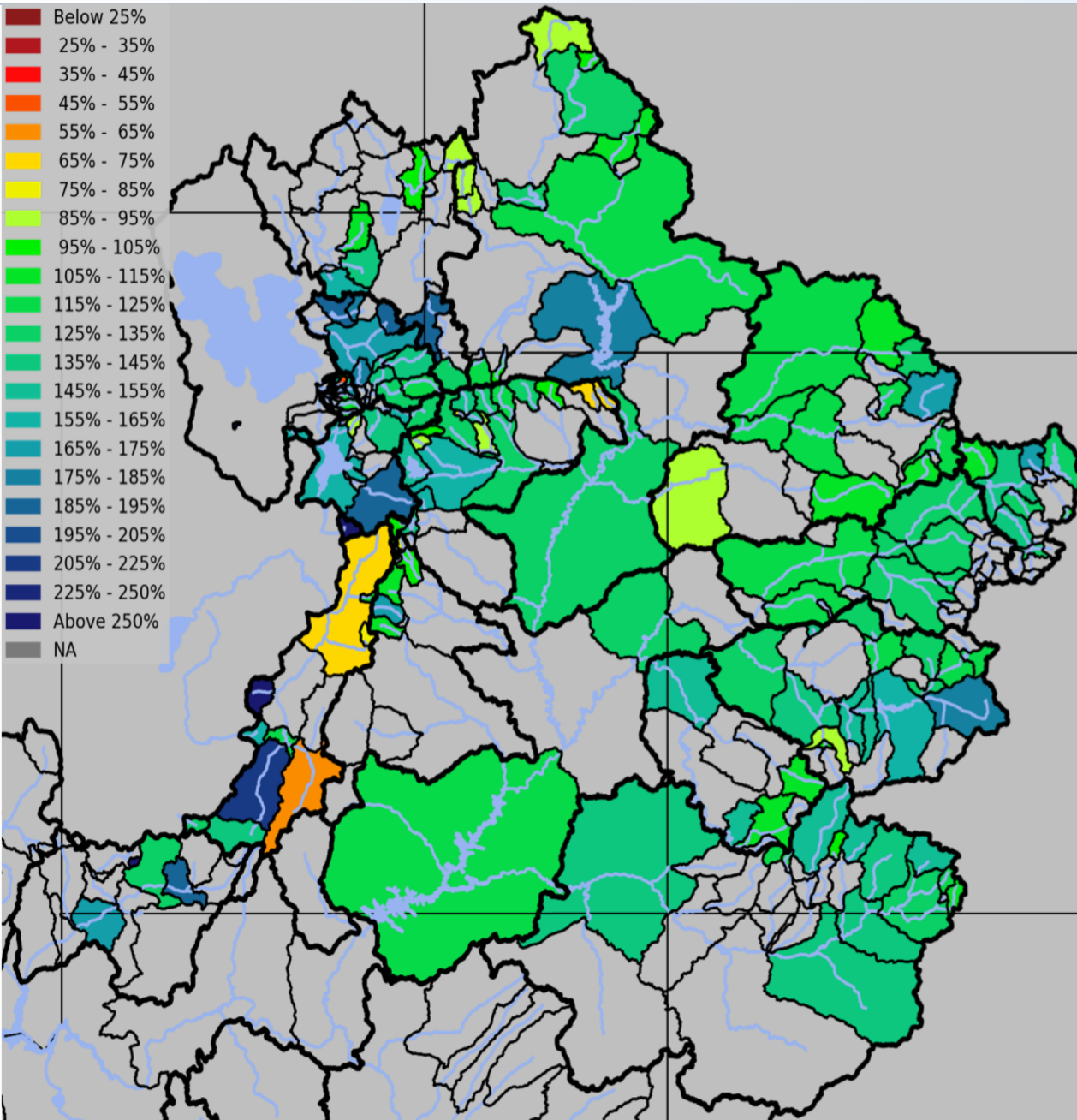
Colorado Basin River Forecast Center

Green abv Fontenelle Group



Median 1981-2010 — 2019 — 2018 —

Colorado River Basin April 2019 Streamflow Volumes (as a % of average)



Basin mean values, site to site observations will vary.

Upper Green	160%
Yampa/White	120%
Duchesne	130%
Lower Green	115%

UC Mainstem	120%
Gunnison	135%
Dolores	145%
San Juan	135%

Powell Inflow:	
1244 KAF	118%

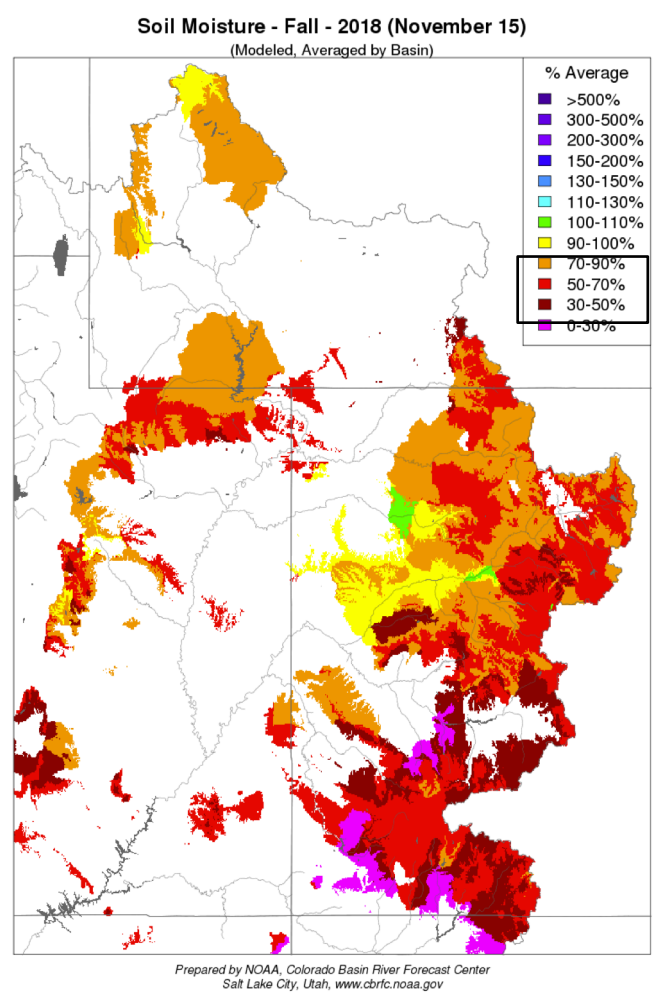
Soil Moisture Impacts

Anticipated soil moisture impacts are accounted for in the April-July forecasts.

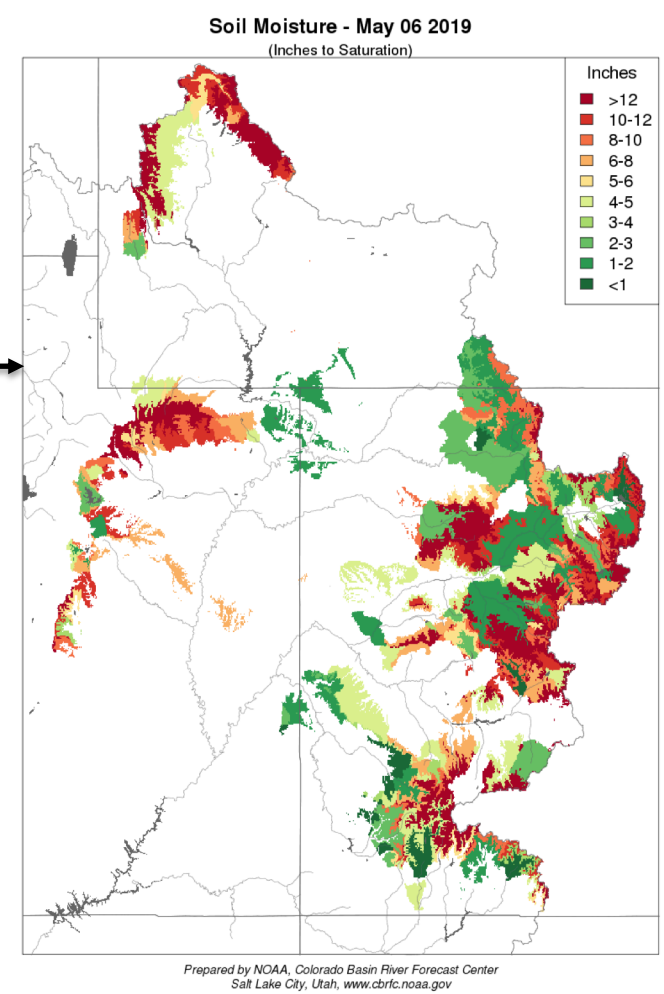
These impacts could be greater or less depending on how rapidly the snow melts.

Upper Colorado Basin: Dry soil conditions are still expected to have some impact on the runoff volumes. However in areas of significant snowpack and where melt is delayed these impacts will likely be less.

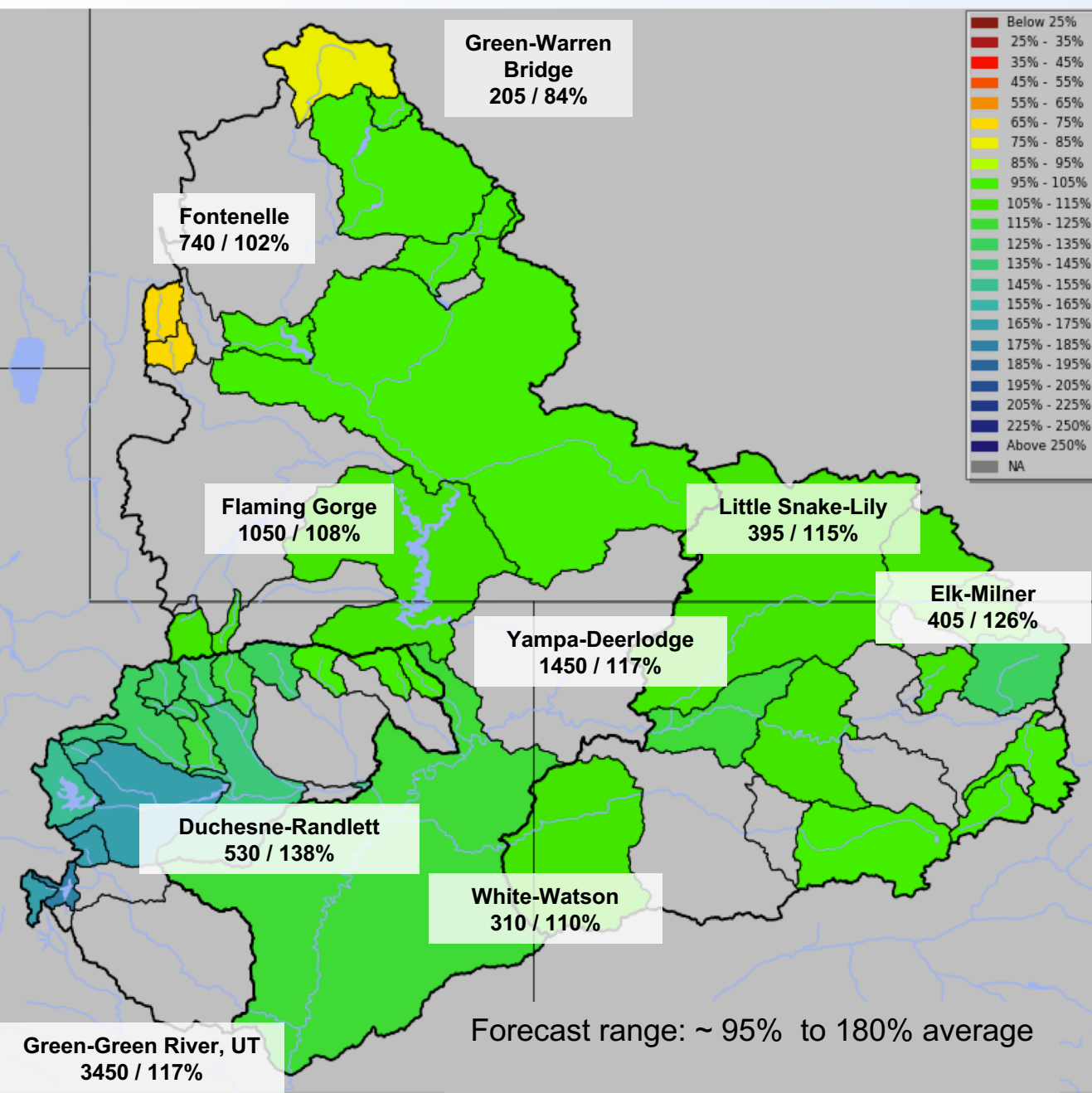
Soil Moisture – Inches to saturation : Lower and some middle elevation areas where we have had melt, rainfall, and runoff indicate soil moisture deficits reduced. Soil moisture impacts may still show up as high elevation snow melts, depending on the snow melt scenario.



Saturated areas will
respond more
efficiently to rainfall



Upper Colorado: Green-Yampa-White-Duchesne



Forecasts as of May 1 2019

Volume 1000's acre feet /
% of 1981-2010 average

Largest increases on the Elk
River, parts of upper Green,
western Duchesne

Minimal or no forecast changes
elsewhere

Important Note

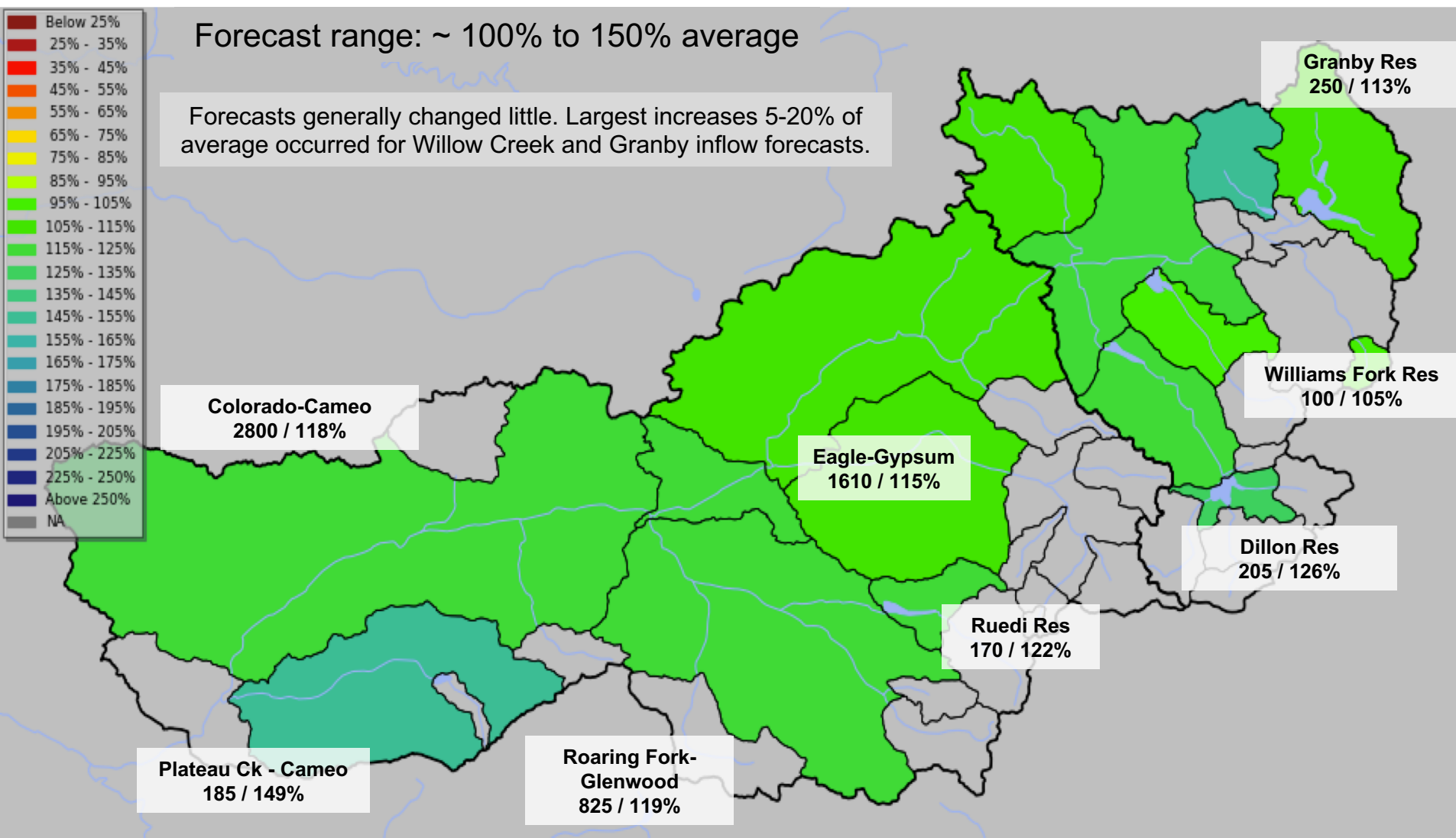
Forecasts are comprised of
April observed volumes
and May-July forecast
volumes.

Quality of observed data
will impact the April-July
forecasts.

Upper Colorado: Colorado River Mainstem

Forecasts as of May 1 2019

Volume in 1000's acre-feet / % of 1981-2010 average

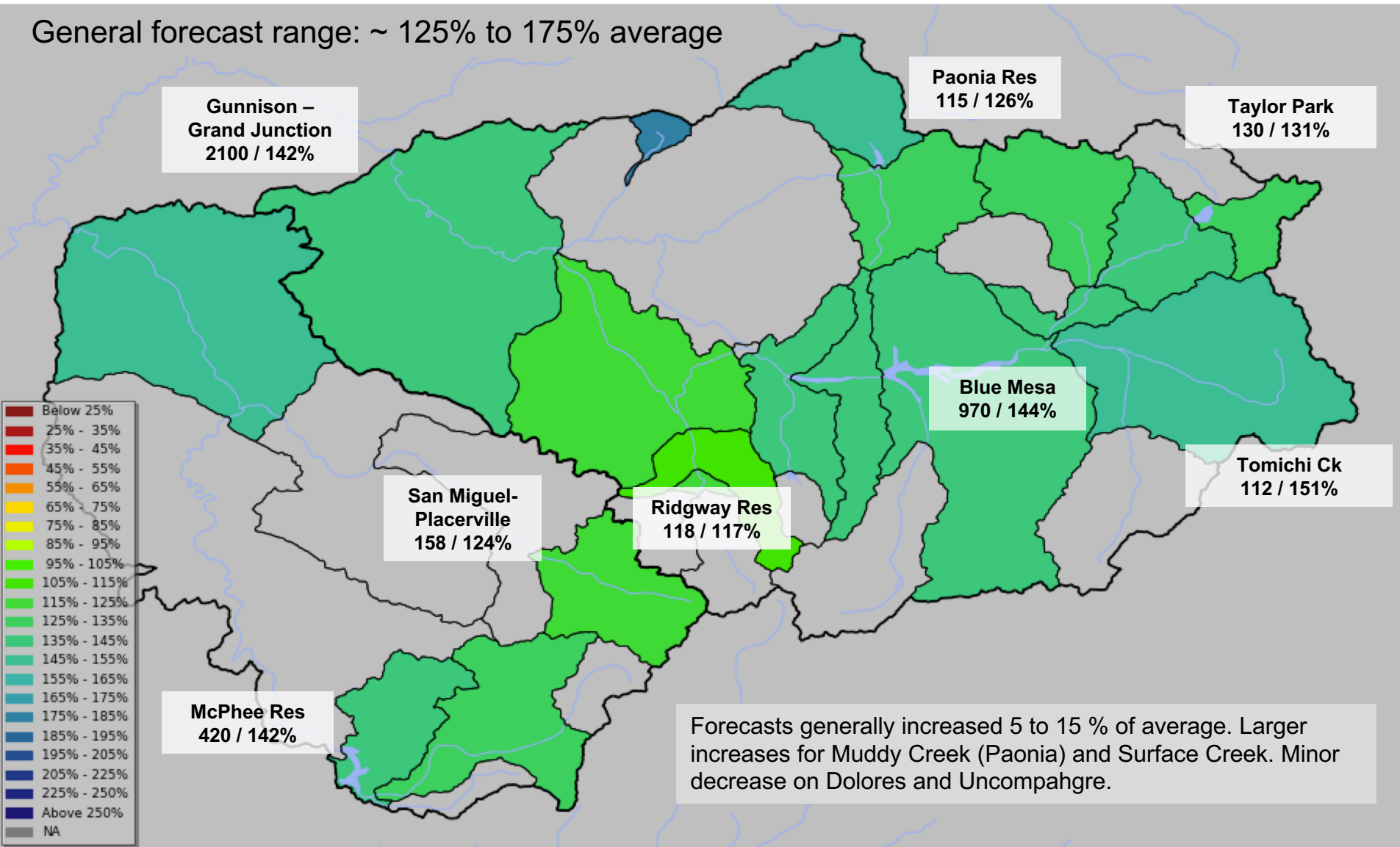


Upper Colorado: Gunnison and Dolores Basins

Forecasts as of May 1 2019

Volume in 1000's acre-feet / % of 1981-2010 average

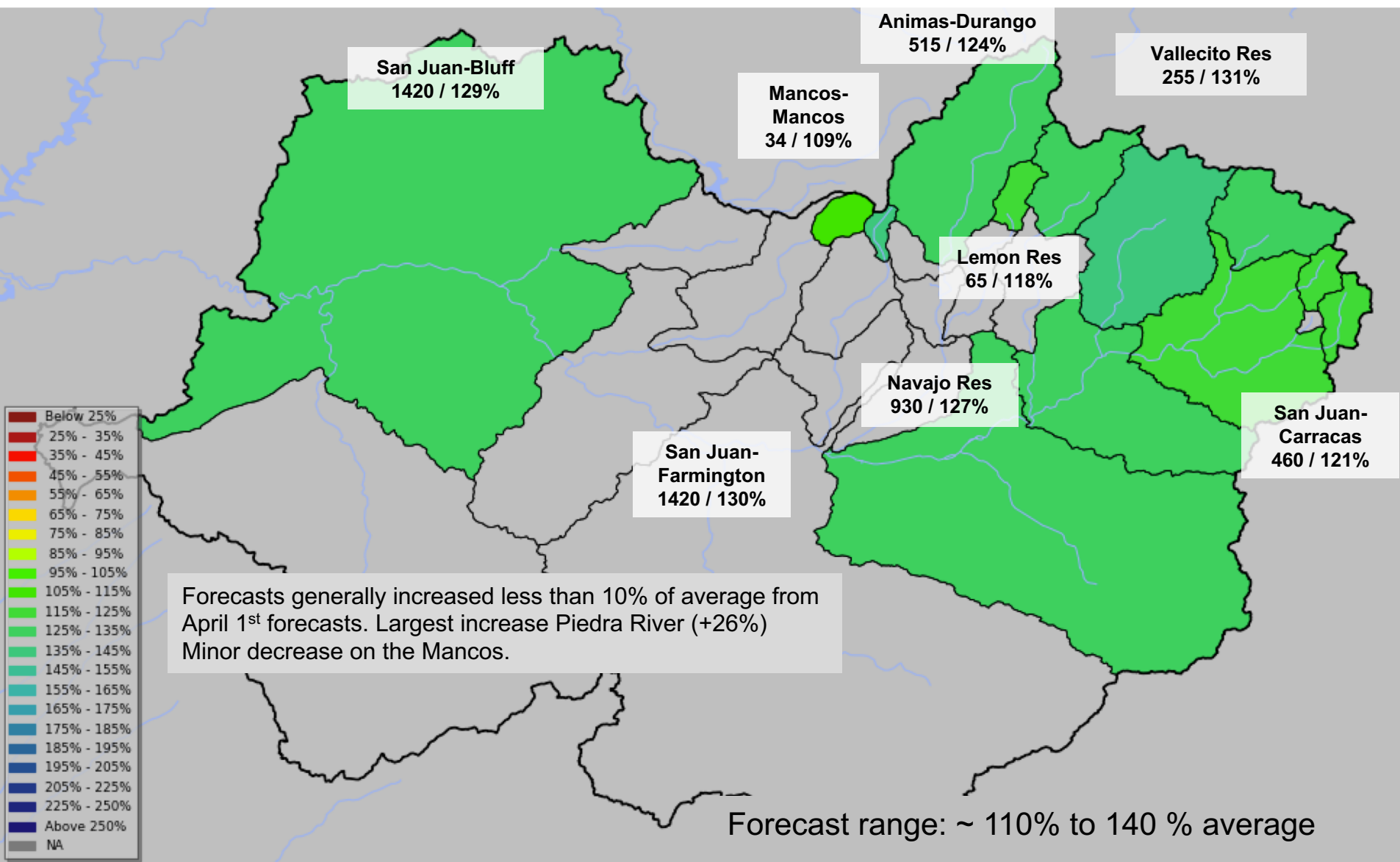
General forecast range: ~ 125% to 175% average

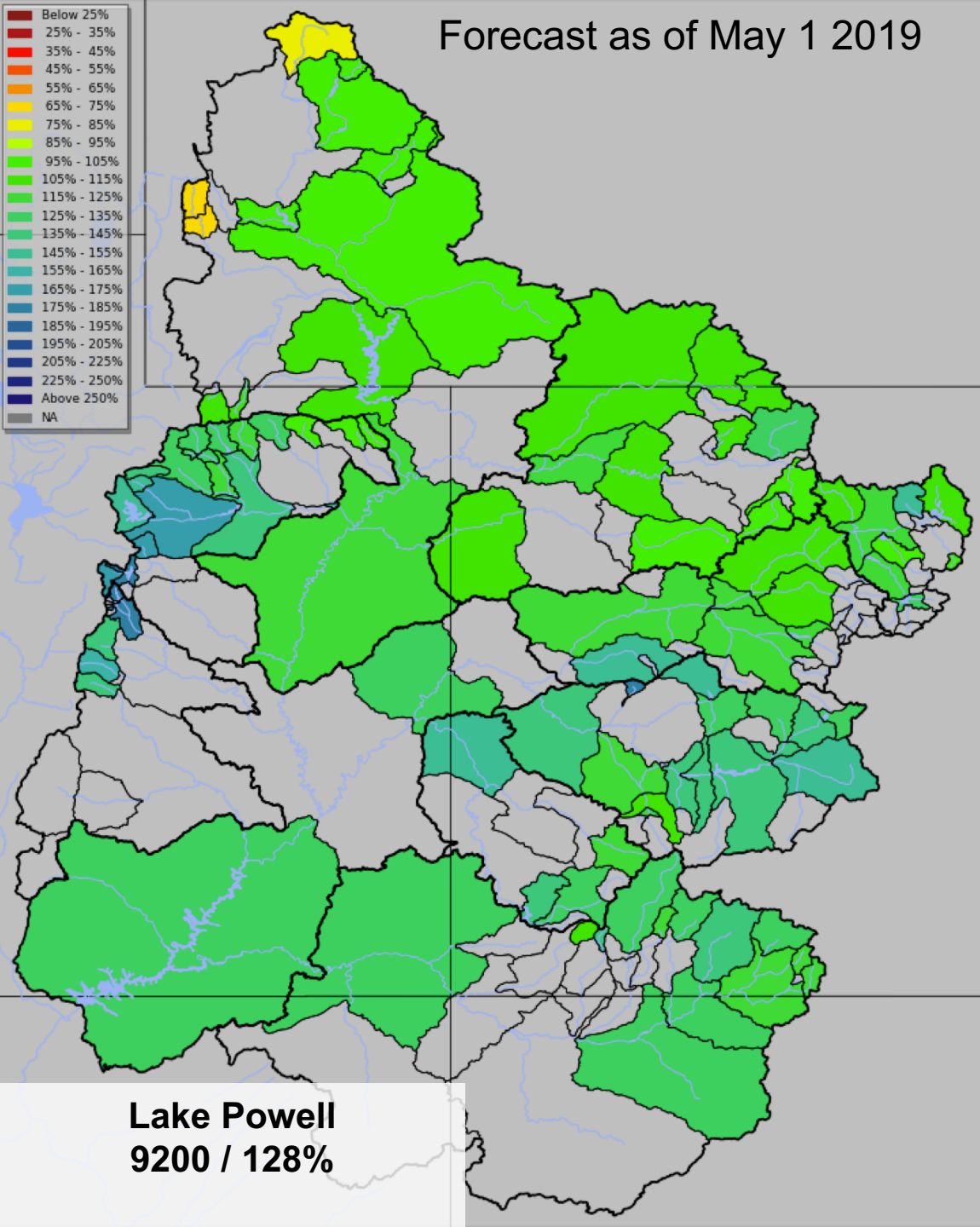


Upper Colorado: San Juan Basin

Forecasts as of May 1 2019

Volume in 1000's acre-feet / % of 1981-2010 average





Upper Colorado April-July Streamflow Volume Forecasts (% of 1981-2010 average)

Lake Powell:
9200 KAF / 128 % average

Lake Powell summarizes the hydrologic conditions throughout the upper Colorado River Basin.

The Lake Powell inflow forecast did not change between April 1st and May 1st.

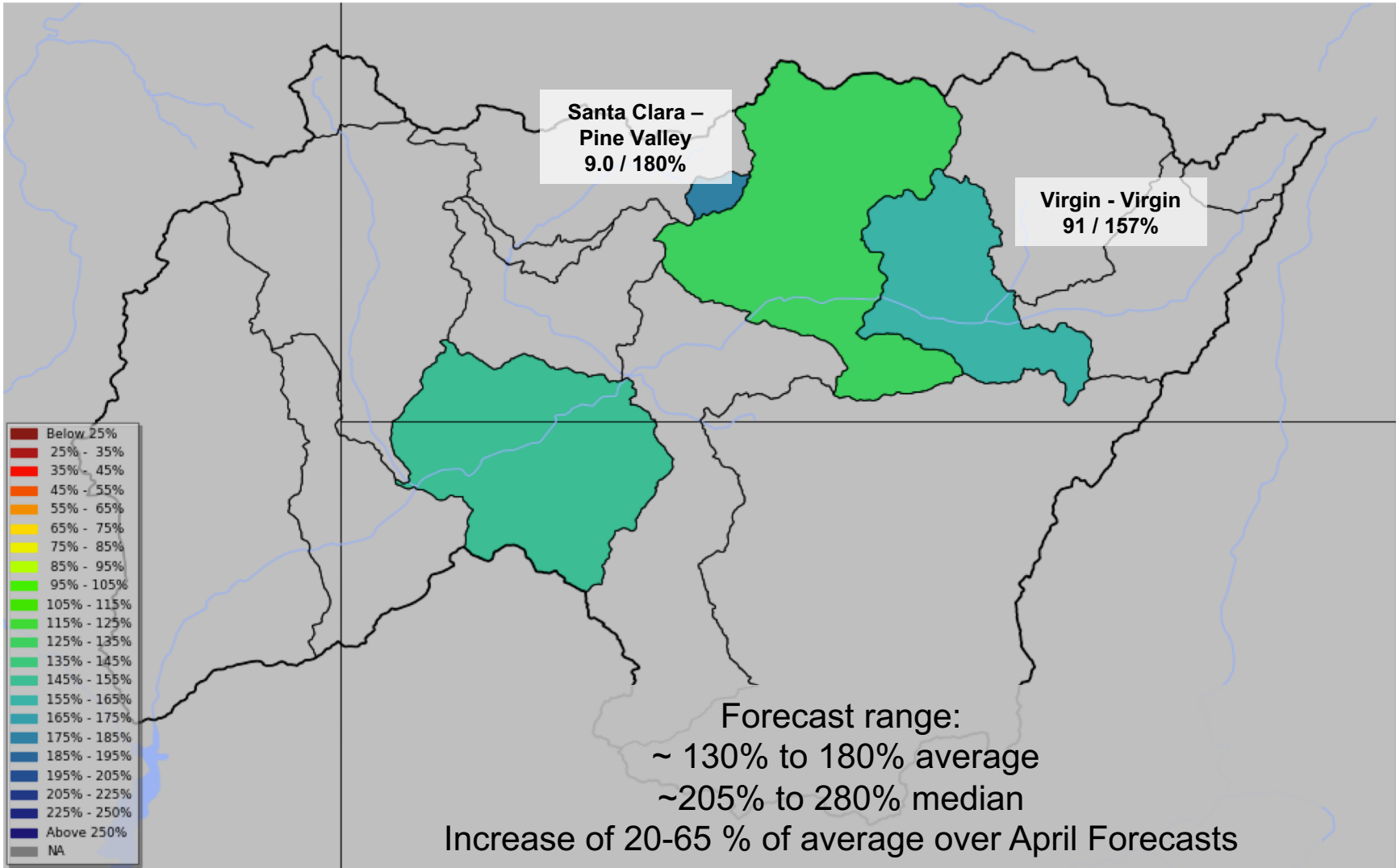
The 9.2 million acre-feet would be the 3rd highest runoff volume in the past 23 years (dating back to and including 1997).

1997 11.6 million acre feet
2011 12.5 million care feet

Lower Colorado (Virgin River) April-July Streamflow Volume Forecasts

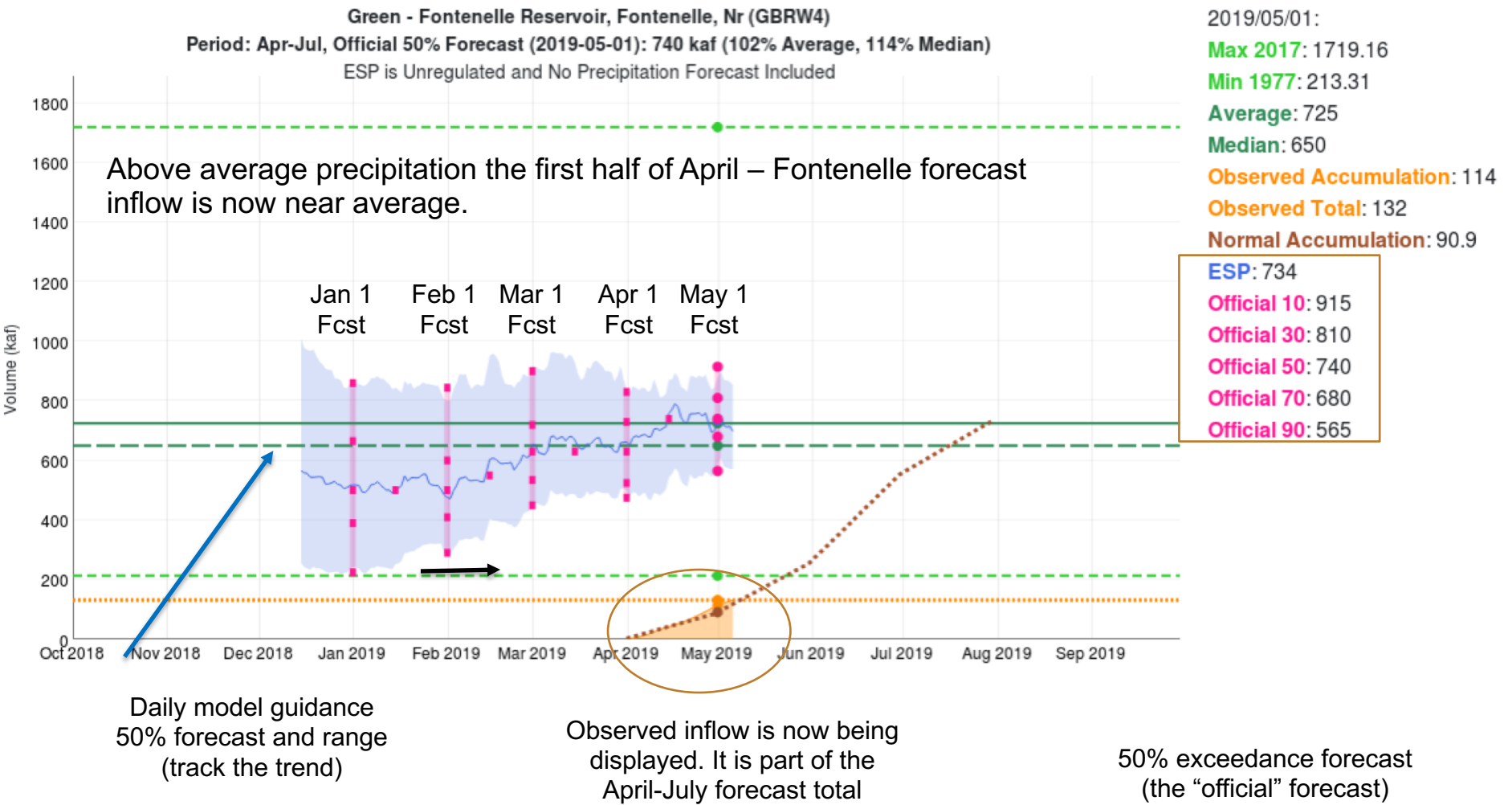
Forecasts as of May 1 2019

Virgin River headwater observed February volume ~140% of average, March ~250% of average, April ~190% of average.

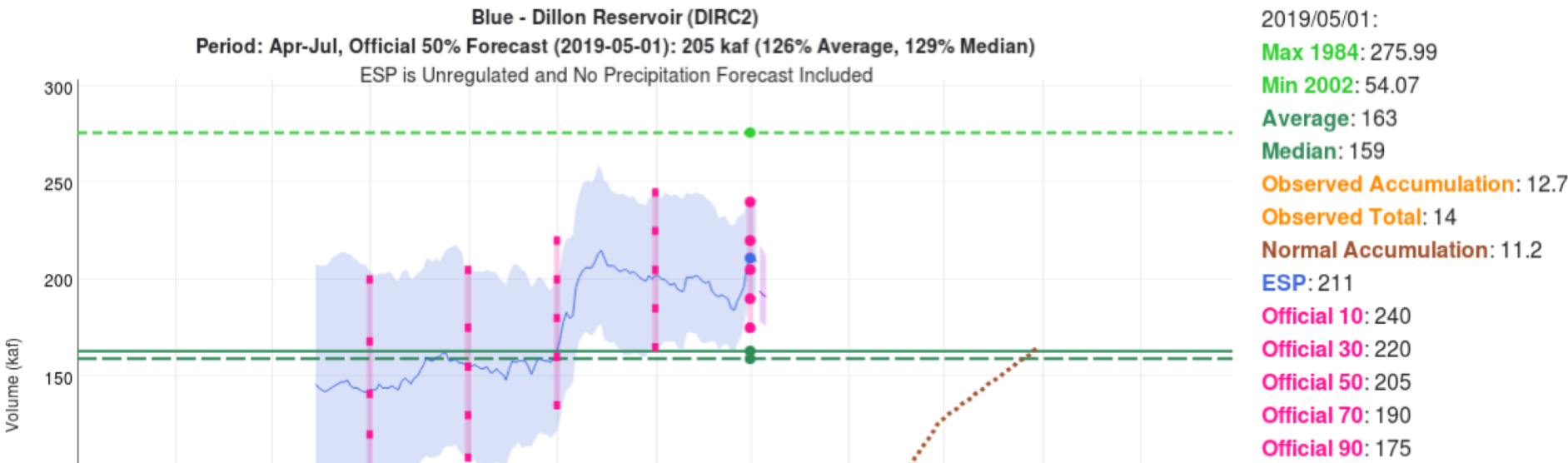


Forecast Evolution Plot: Fontenelle Reservoir (Upper Green Basin - Wyoming)

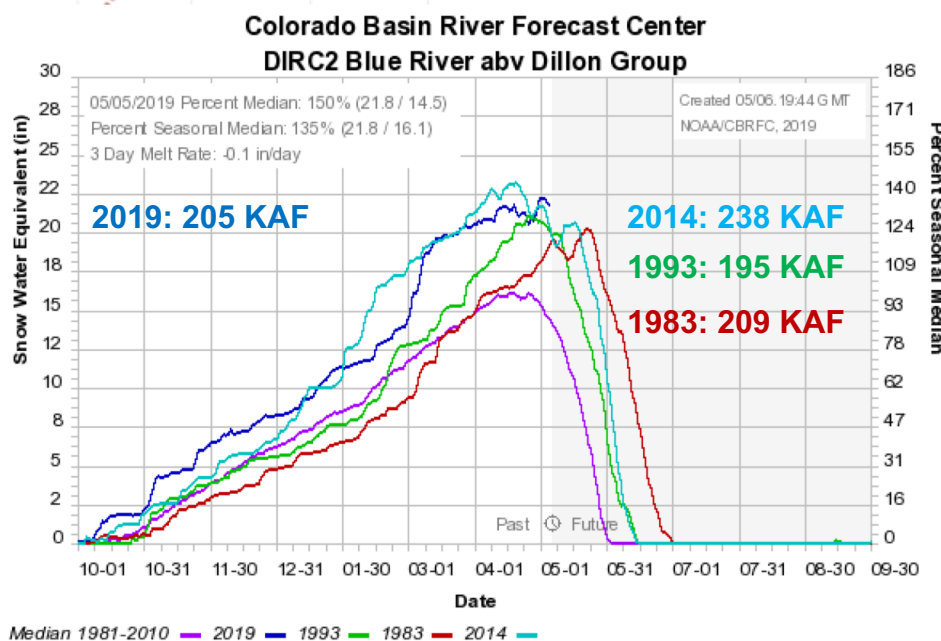
ESP – Ensemble Streamflow Prediction



Forecast Evolution Plot: Dillon Reservoir Inflow (Colorado Headwaters)



Guidance decreased through most of April. Late April precipitation resulted in a rebound



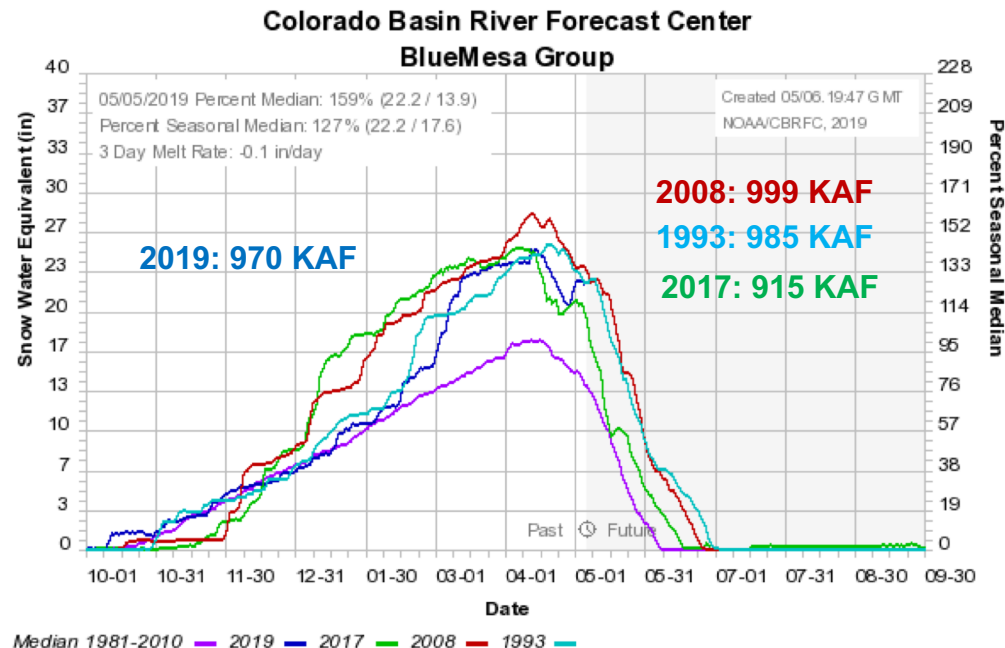
Forecast Evolution Plot: Blue Mesa Inflow (Gunnison Basin)



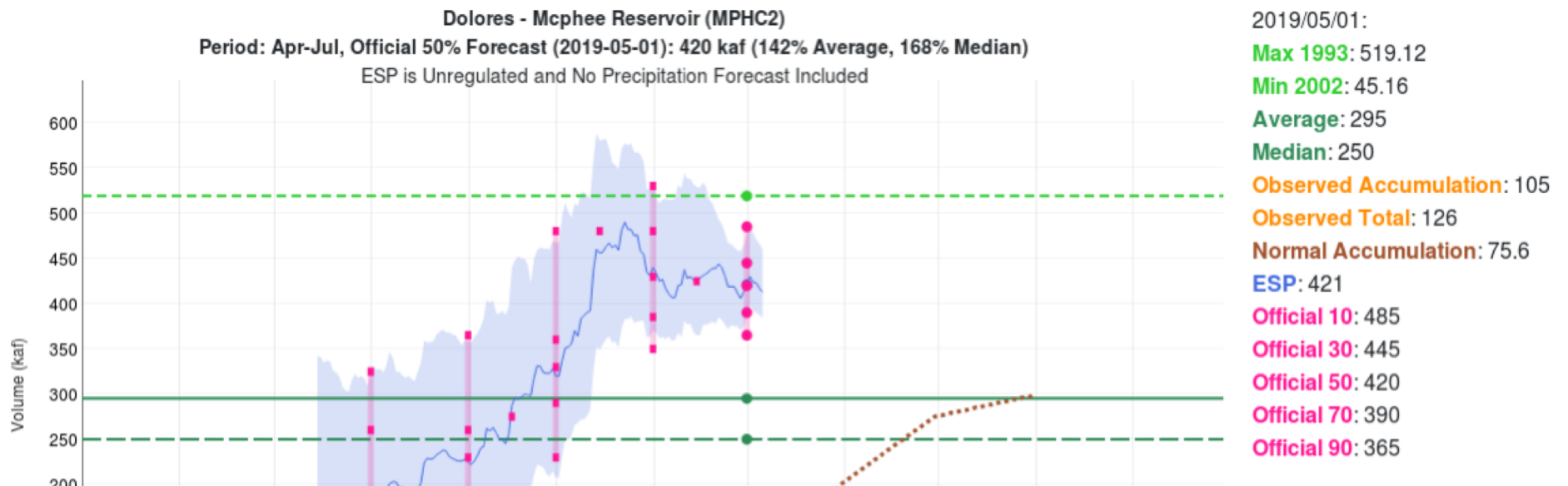
2019/05/01:

- Max 1984: 1433.01
- Min 2002: 156.55
- Average: 675
- Median: 575
- Observed Accumulation: 121
- Observed Total: 156
- Normal Accumulation: 84.5
- ESP: 1020
- Official 10: 1200
- Official 30: 1040
- Official 50: 970
- Official 70: 945
- Official 90: 870

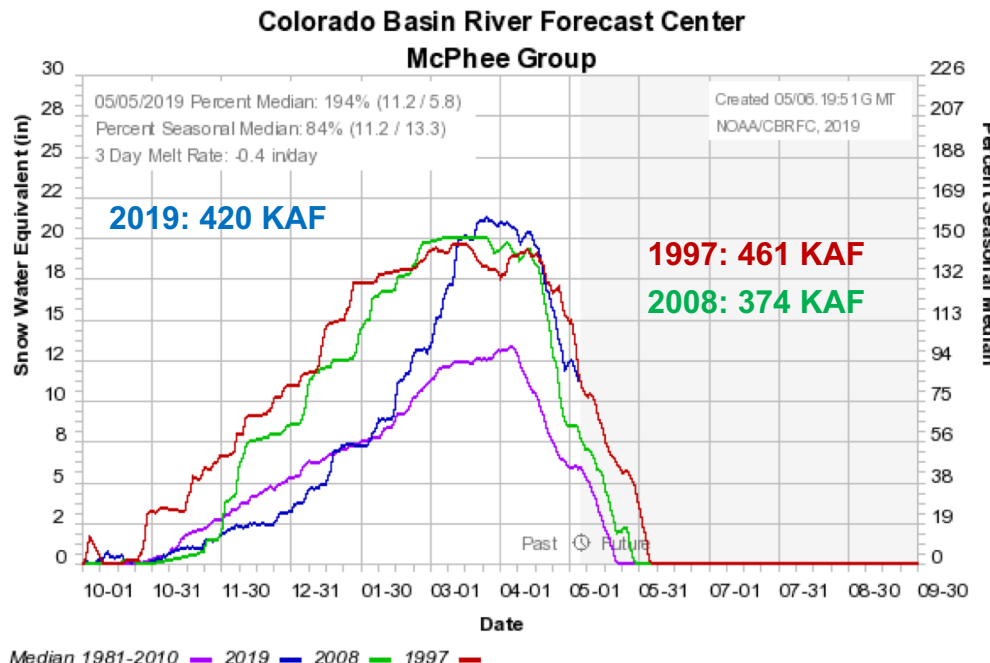
Strong increase at the end of April due to end of month precipitation event.



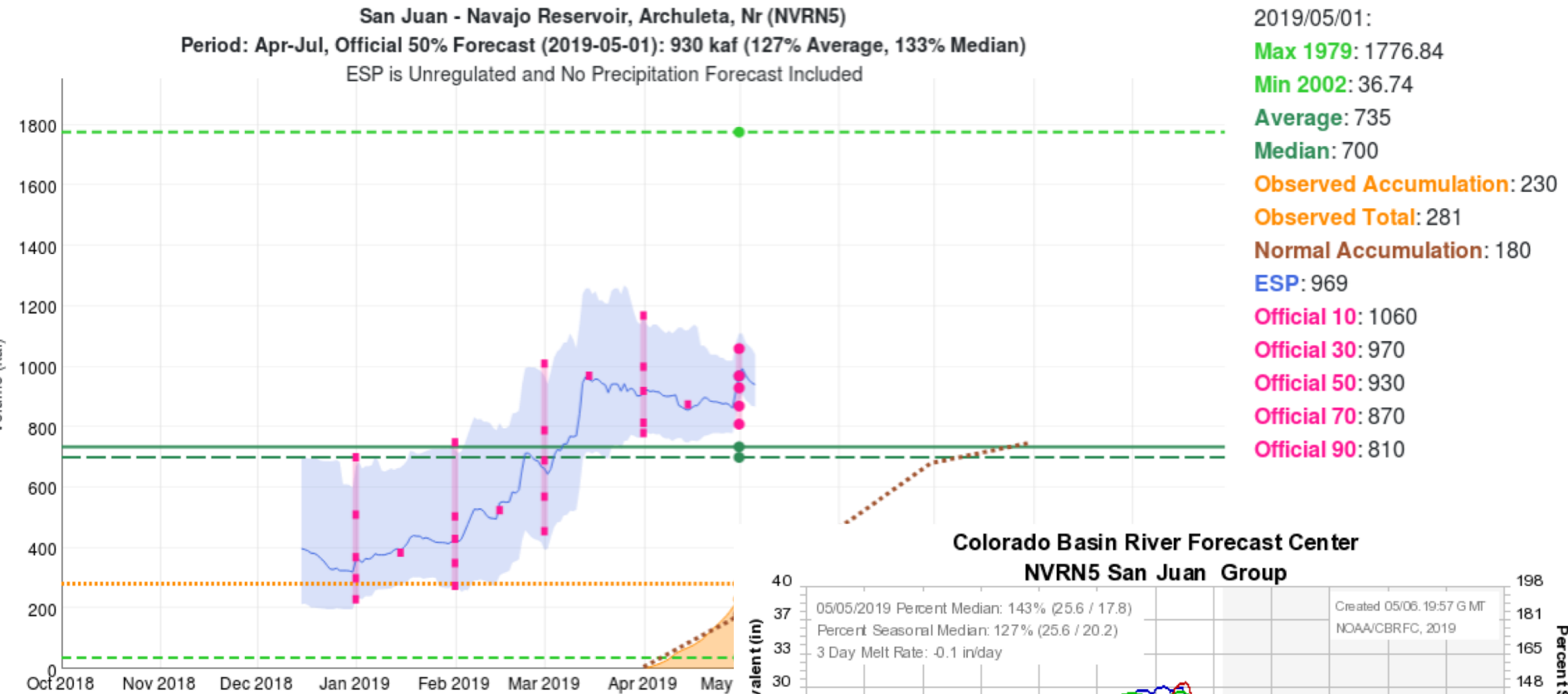
Forecast Evolution Plot: McPhee Inflow (Dolores Basin)



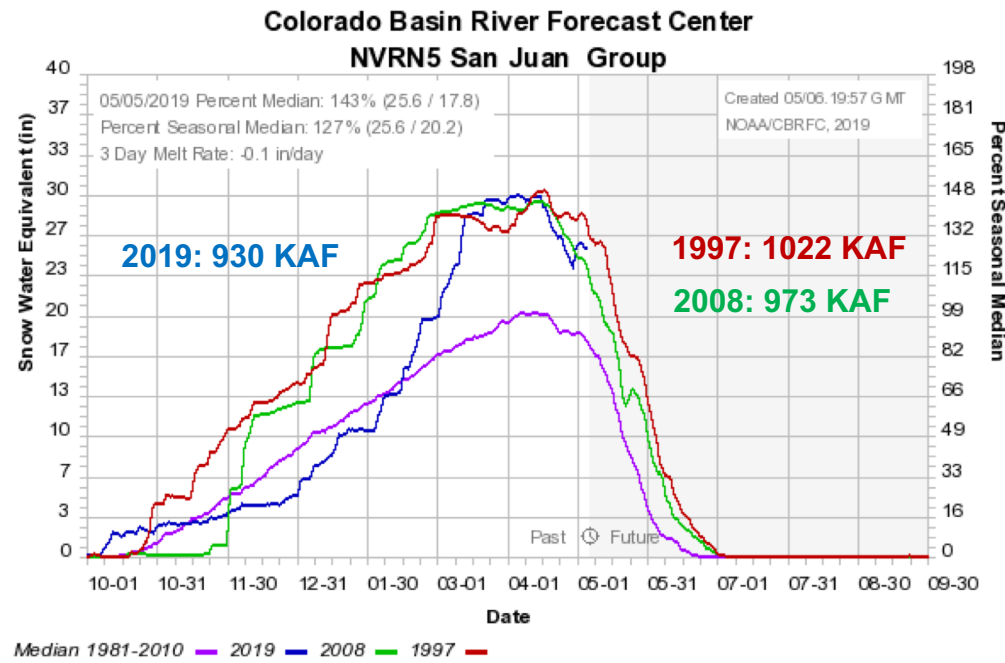
Model guidance has fluctuated but remained fairly consistent since early April.



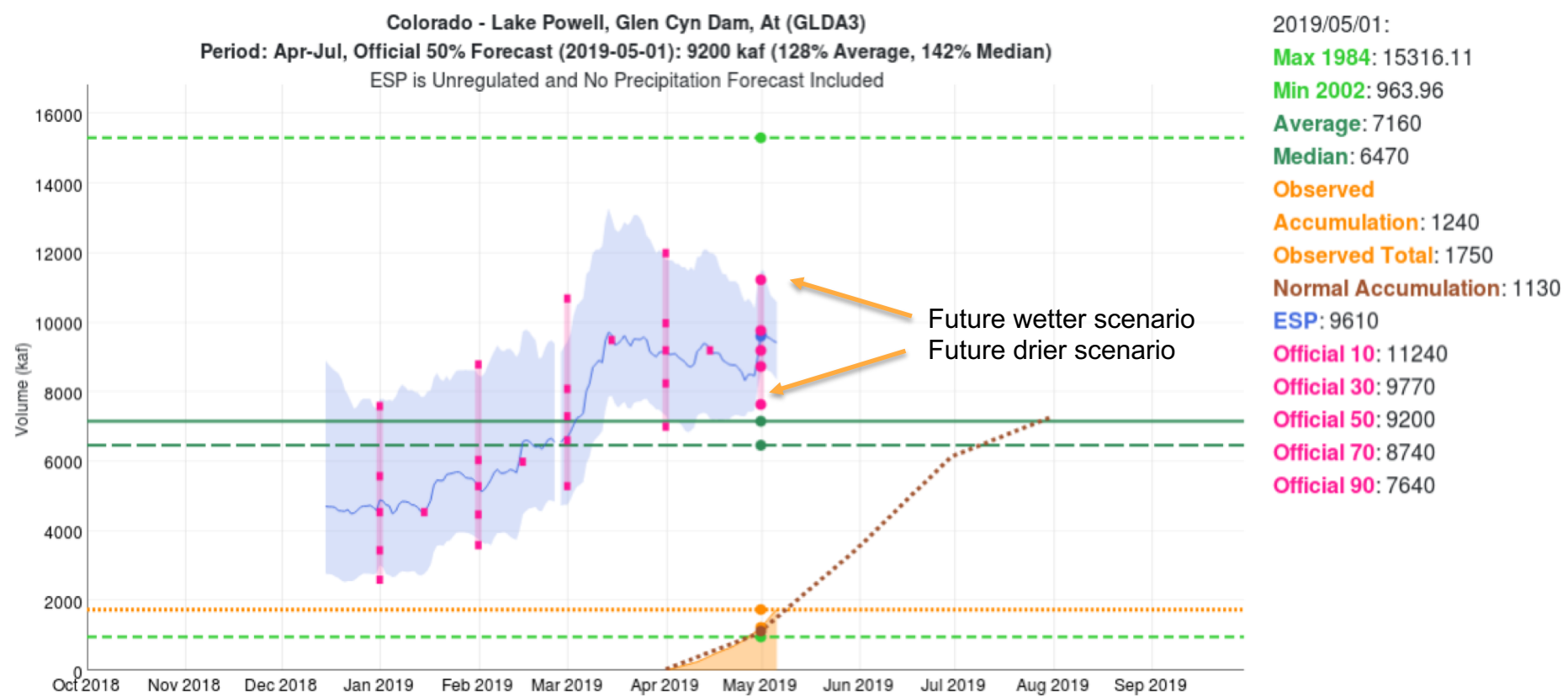
Forecast Evolution Plot: Navajo Inflow (San Juan Basin)



Guidance trended down much of April due to dry conditions. Significant increase in runoff in late April as lower elevation snow melted.

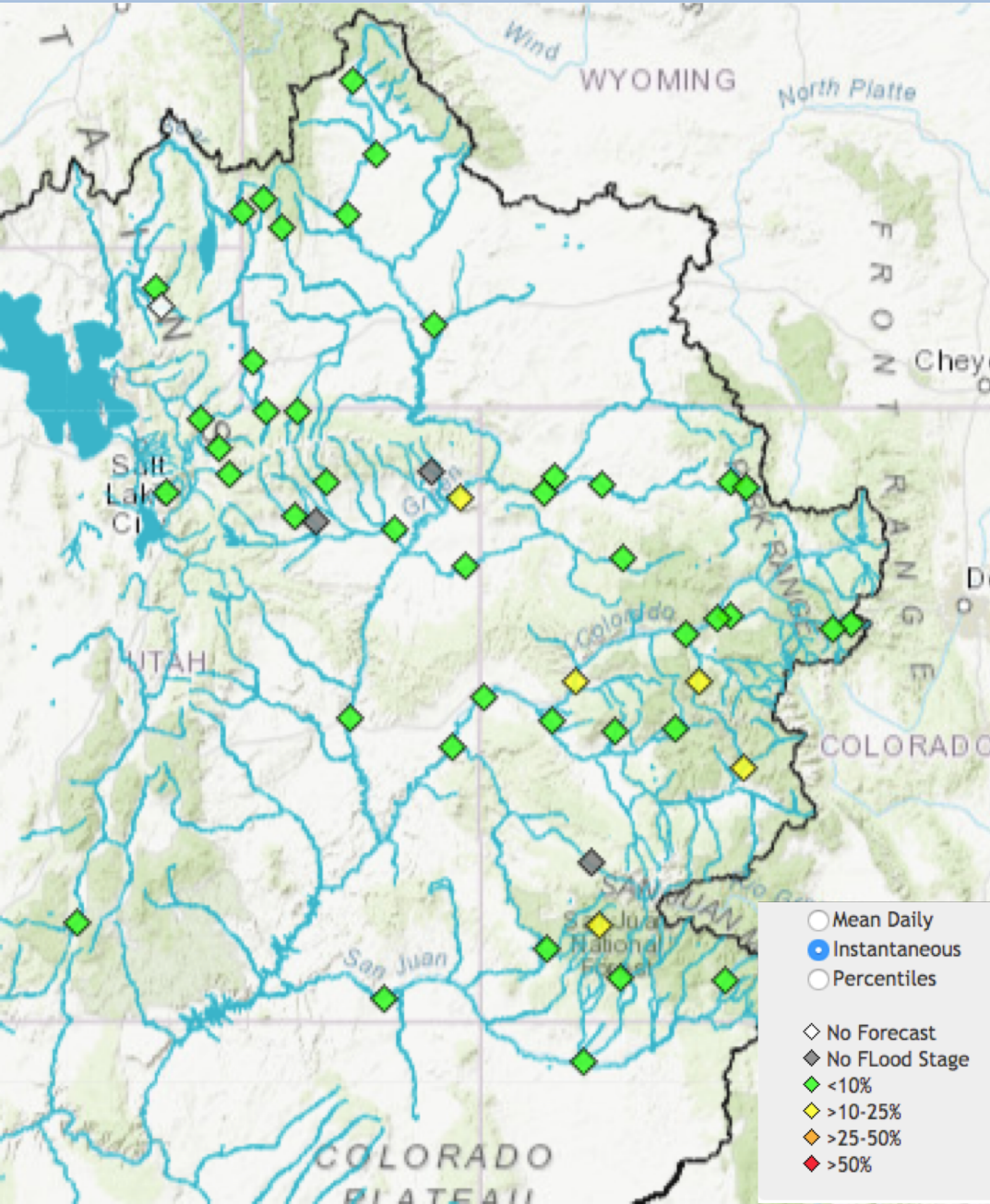


Forecast Evolution Plot: Lake Powell Inflow (Upper Colorado Basin)



Guidance trended down the 2nd half of April but rebounded due a combination of late April precipitation and increase in observed runoff in upstream basins

- Currently no forecast points reach flood stage at the 50% exceedance forecast for mean daily or instantaneous peaks
- Several sites fall into the 10-25% chance of reaching an instantaneous peak flood flow.
- Rainfall and much above average temperatures will of course impact peaks – focus on the daily model as near the peak period.



How high might streams be running compared to historical record?

Upper Colorado Headwaters:

Tenmile Creek – Top 25%

Crystal River – Top 25%

Gunnison Headwaters:

East River – Top 35%

Surface Creek – Top 17%

Dolores Headwaters:

Above Rico - Top 30%

San Miguel – Top 25%

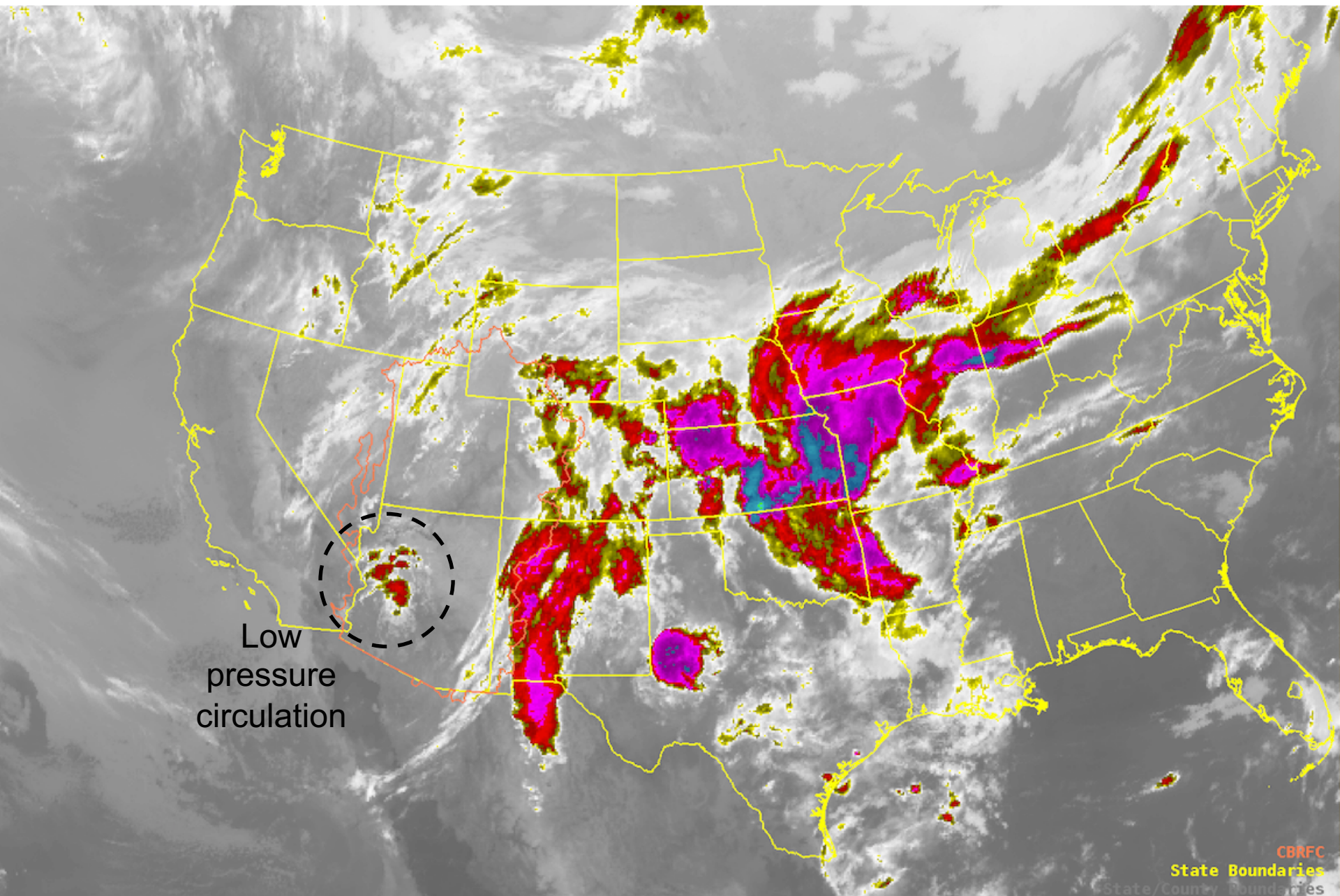
San Juan Headwaters:

Upper San Juan- Top 30%

Animas – Top 30%

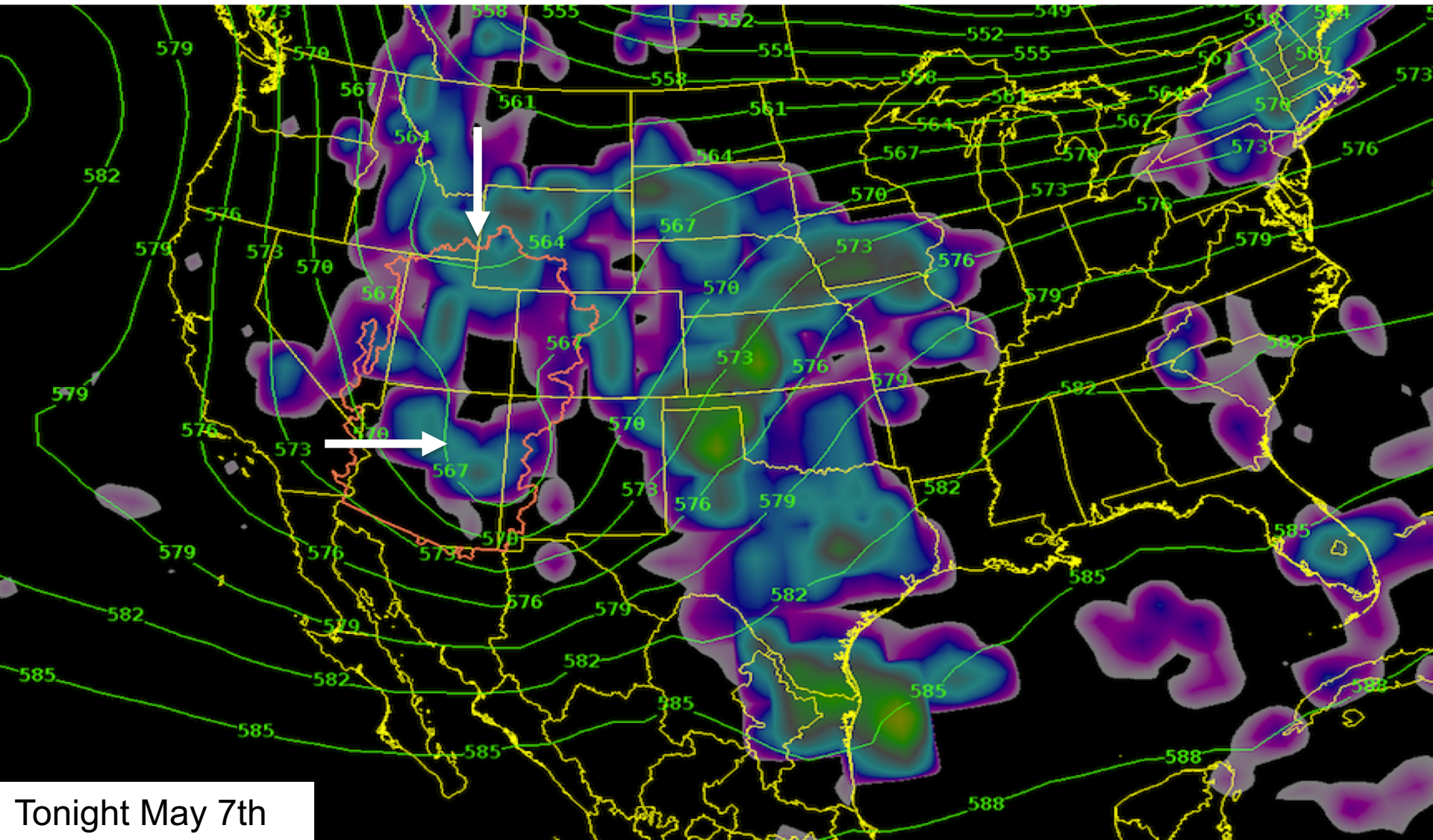
This morning – Satellite image from this morning

Low pressure system moving through the area with an increase in cloud cover and instability



Upcoming Weather – Period of increasingly unsettled weather.

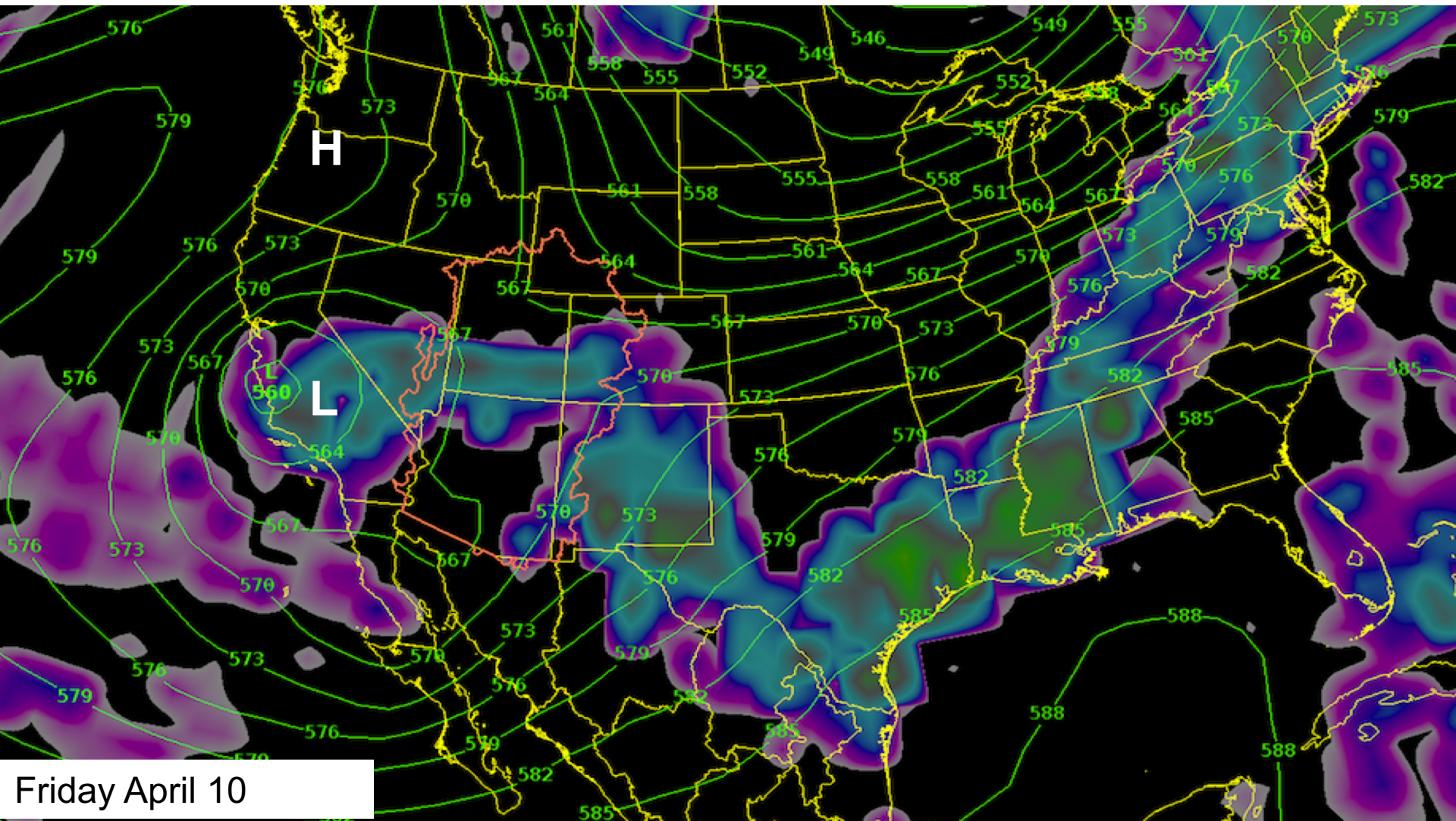
Low pressure moves east through the day as systems drops in from the north. Increasing instability resulting in showers / thundershowers. Temperatures a few degrees below normal, snow levels down to 8000-9000 feet. Subtle differences in features greatly influence precipitation impacts.



Tonight May 7th

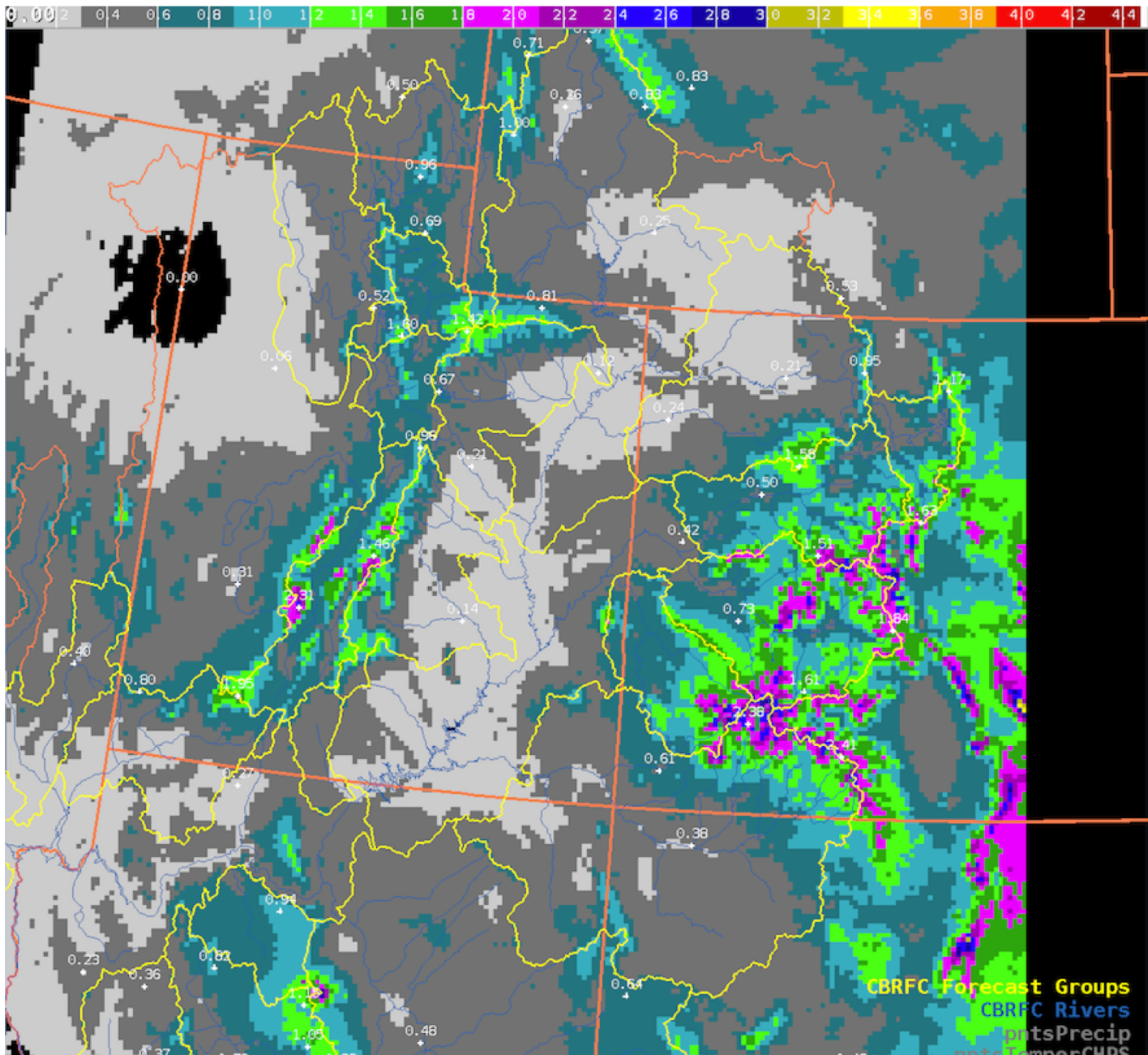
Upcoming Weather – Blocking pattern

Low pressure system retrogrades along / off the west coast with adjacent high pressure to the north (known as a rex block pattern). Low pressure tends to have little east-west movement. The prevailing flow feeds moisture into the forecast area with occasional showers and temperatures running just below seasonal normal.



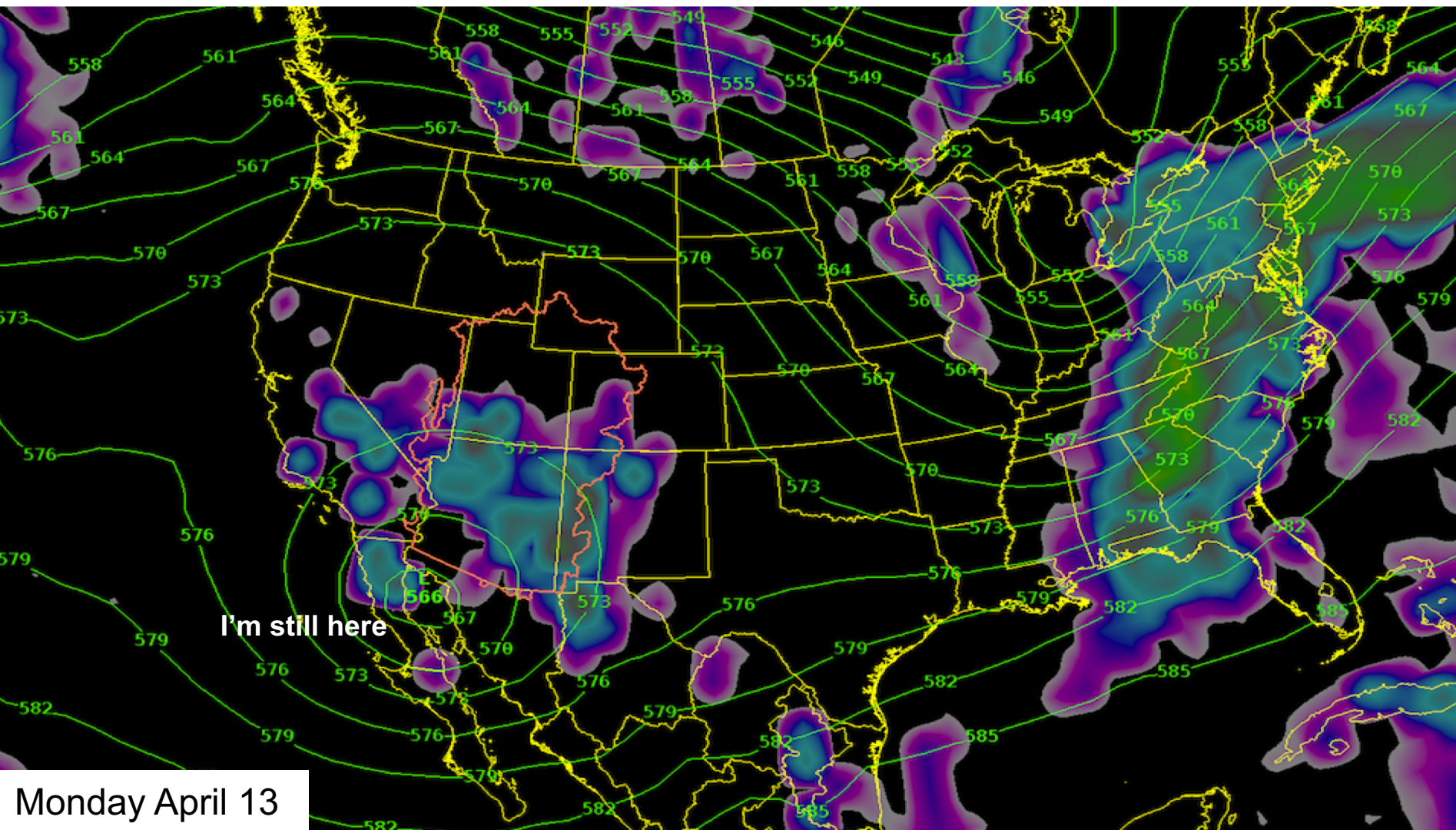
Friday April 10

Precipitation forecast over the next 5 days (most in the next 72 hours). Larger amounts central Utah / Colorado and south with 1-3 inch precipitation amounts widespread.



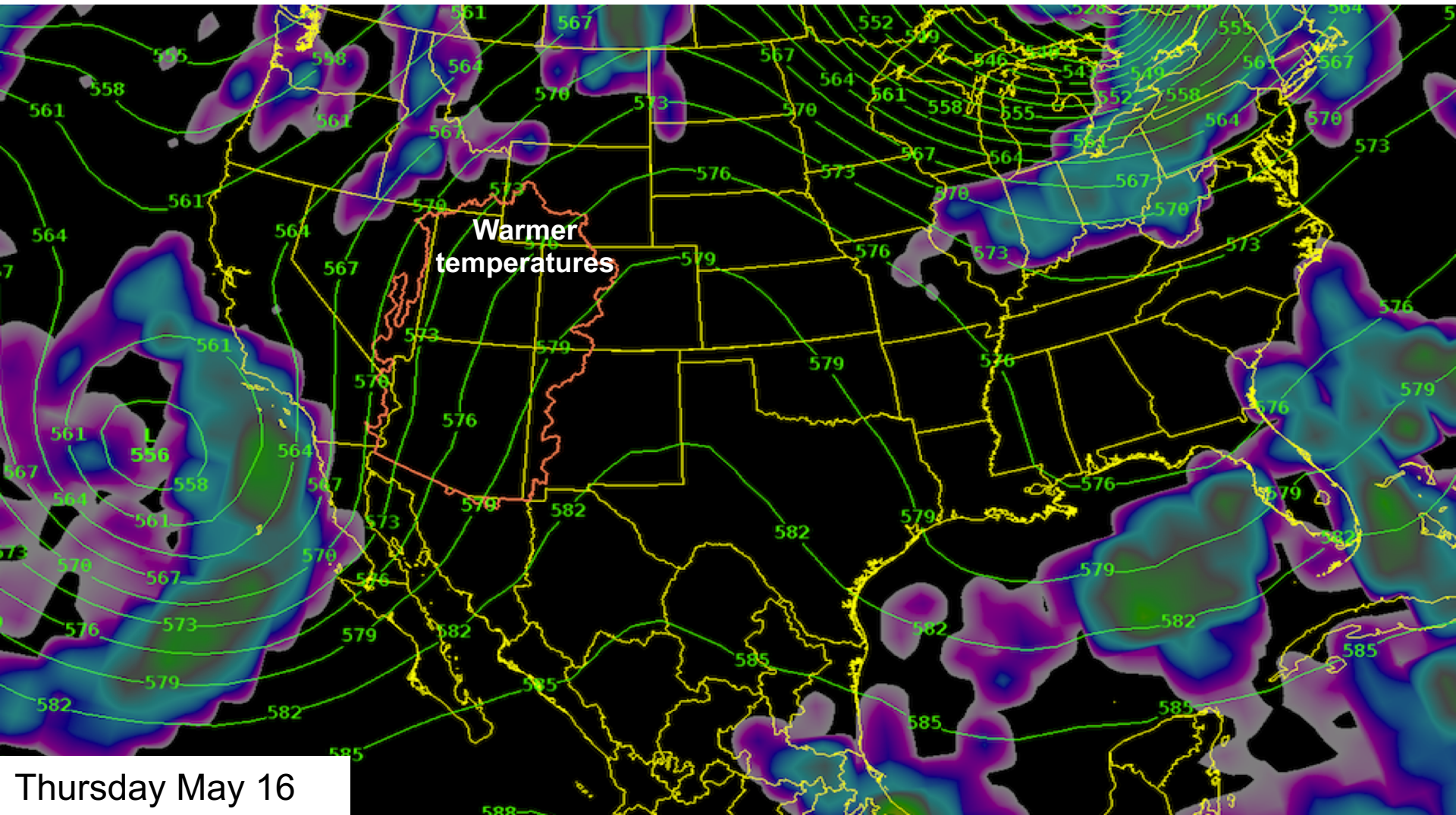
Upcoming Weather – Low pressure southwest dominates start of next week

Models still have the low pressure dominating the pattern over the forecast area but hint at ejecting it eastward as the week progresses. Warmer and dryer weather may follow. This would have implications for peak flow projections particularly for lower elevation basins.



Upcoming Weather – Warmer temperatures next week (but for how long?) (low confidence at this time)

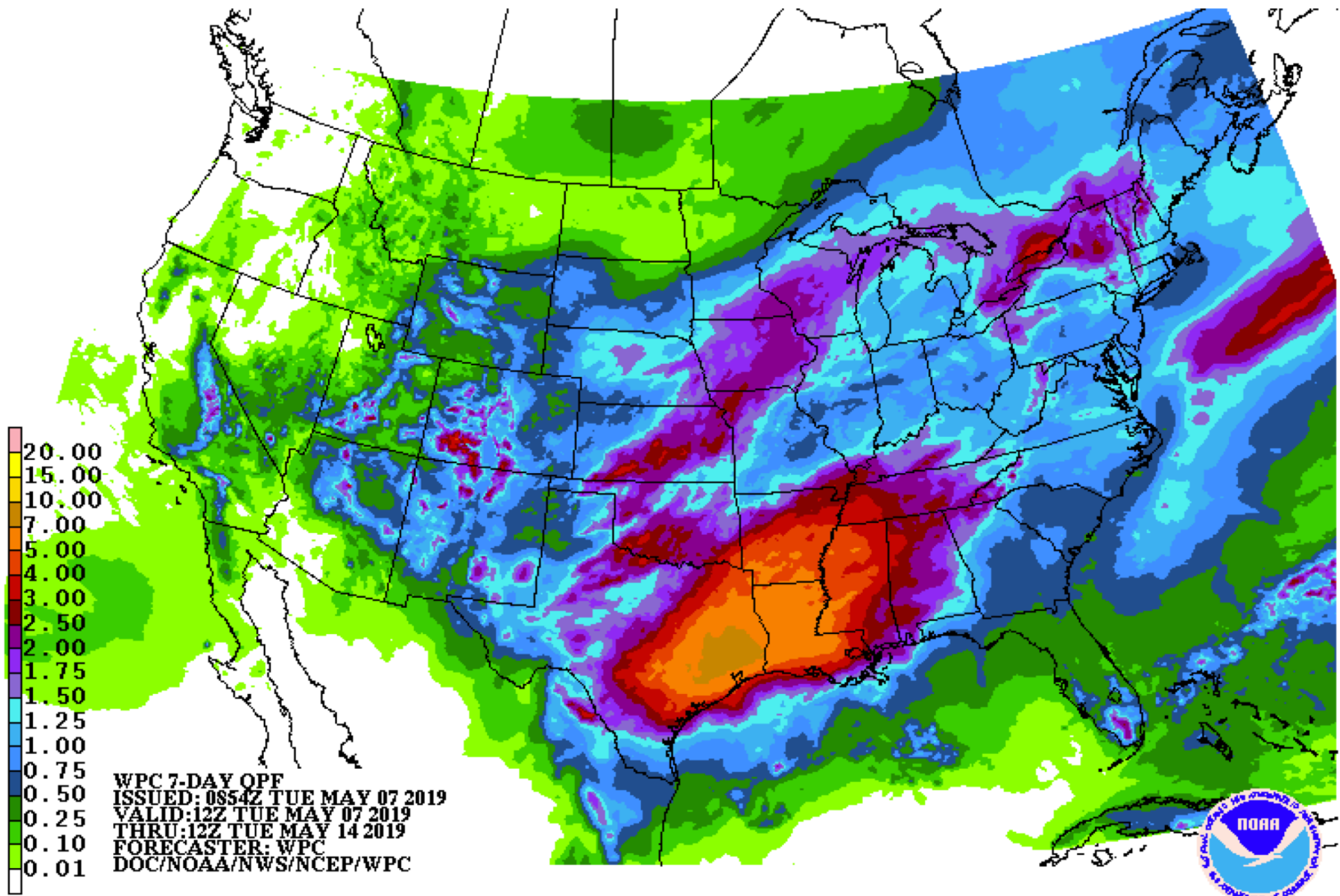
High pressure and above normal temperatures develop next week ahead of another storm system. The question is how long the period of above average temperatures persist before moisture (increasing cloud cover & showers) associated with the next storm arrives. This will have implications for lower elevation basin peak flows. Cooler, wet weather for the 18th -19th weekend.



Thursday May 16

Precipitation Outlook – Next 7 Days

Weather Prediction Center Precipitation Outlook May 7– May 14th



Longer Range Weather: The 8-14 day outlook and peak flow implications

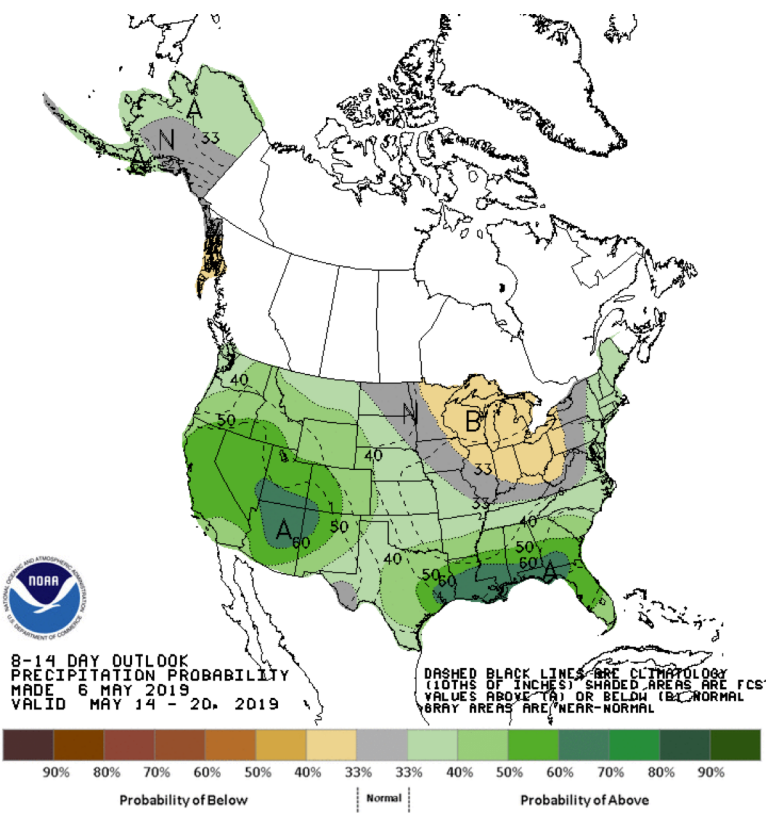
Pattern remains progressive / active approaching Memorial Day weekend

Pattern is trending wetter with periods of below and above average temperatures.

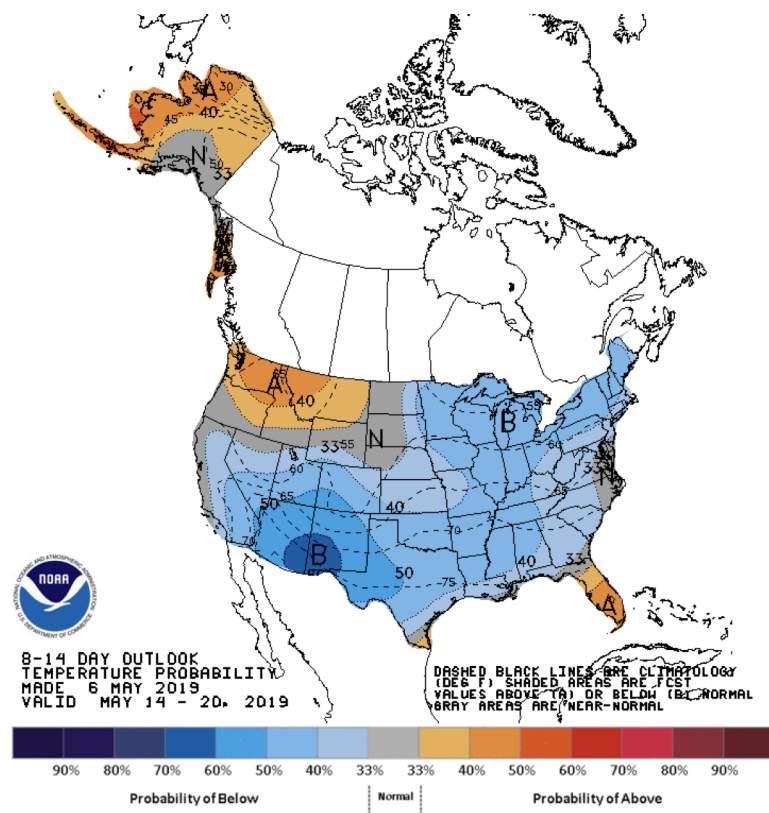
Higher elevation snow melt should drop off significantly over the next several days. Melt should resume next week but could be hampered later in the week by increasing cloud cover.

This weather pattern is not necessarily conducive to a well defined peak flow. It's the most difficult for forecasting the timing of a peak (ideally we would see a period of extended above average temperatures).

May 14-20



May 14-20



Longer Range Weather: The 8-14 day outlook and peak flow implications

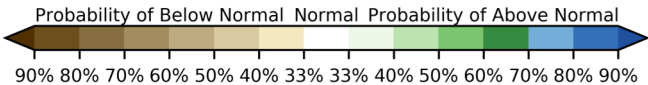
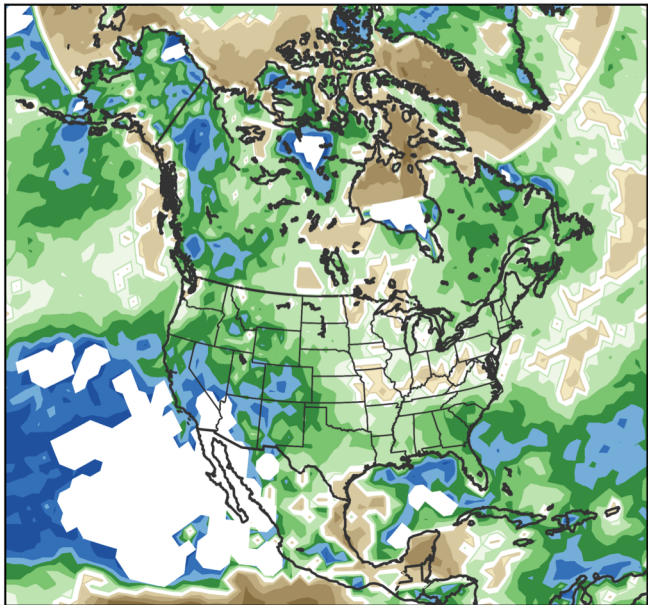
Pattern remains progressive / active approaching Memorial Day weekend

Warming next week could initiate seasonal peaks on lower elevation basins. Higher elevation basins still appear to fall into the late May- early June timeframe. Northern Basins (Green-Wyoming) more likely in June.

There is higher confidence for a longer period of higher (above average) flows even though a well defined peak may not be realized. Depending on temperatures and elevation of the basin this likely period is from mid May possibly well into June.

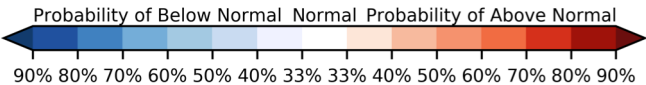
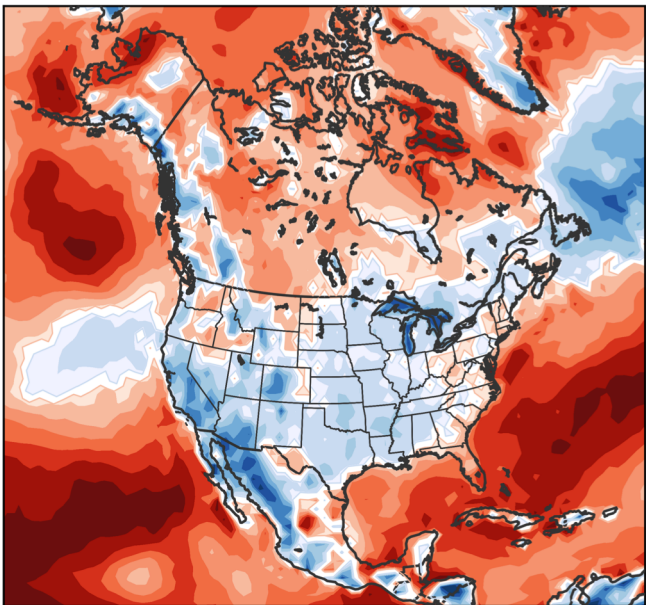
May 15-21

NAEFS Raw Precip Probabilities
8-14Day Forecast Issued 2019-05-07
Valid 2019-05-15 to 2019-05-21



May 15-21

NAEFS Bias-Corrected Tmean Probabilities
8-14Day Forecast Issued 2019-05-07
Valid 2019-05-15 to 2019-05-21



North American Ensemble
Forecast System

2019 water supply briefing schedule

Great Basin/Utah webinar today 1:30 pm MDT

Additional webinar will be scheduled in early June if needed

All registration information has been posted to the CBRFC web page

Today's Presentation:

www.cbrfc.noaa.gov/present/present2019.cgi

CBRFC Water Supply Contacts

Please contact us with any questions

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